

Carmen Johnson

36-05 ~~36-05~~ 3/20/12 (y)

PRELIMINARY EVALUATION

FMC CORPORATION - LITHIUM DIVISION
BESSEMER CITY, NORTH CAROLINA

SOLID WASTE LANDFILL
PERMIT NO. 36-05

JUNE 1996

FMC Corporation

Lithium Division
Highway 161
Box 795
Bessemer City North Carolina 28016
704 868 5300 Fax 704 868 5486



Certified Mail
Return Receipt Requested

June 26, 1996

North Carolina Department of Environment,
Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687
Raleigh, NC 27611-7687

Attn: Mr. James C. Coffey, Supervisor
Permitting Branch
Solid Waste Section

Re: FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill Permit No. 36-05

Dear Mr. Coffey:

In response to the Division of Solid Waste Management's ("DSWM") January 22, 1996 letter, over your signature, FMC Corporation's Lithium Division facility in Bessemer City ("FMC") is herewith submitting a Preliminary Evaluation of its Solid Waste Landfill for review by DSWM.

FMC operates an onsite landfill so as to provide for the disposition of mineral extraction wastes, primarily tailings. These tailings result from the extraction of lithium from locally mined spodumene. However, the local source of spodumene, FMC's mine near Cherryville, North Carolina, is nearing the end of its useful life and FMC has identified a new lithium resource in South America. FMC is currently constructing a new facility in Argentina which will extract lithium from a brine resource using newly developed proprietary technology.

The Argentina facility will extract the lithium and manufacture lithium chloride and/or lithium carbonate. These lithium products will be shipped to Bessemer City for further processing, beginning as soon as late 1996. With the Bessemer City plant's lithium resource shifting to refined lithium

Mr. James C. Coffey - DSWM
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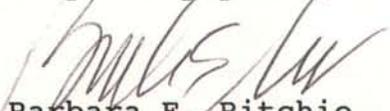
chemicals (which Bessemer City will continue to be processed further into more refined lithium chemicals) the plant will cease to generate mineral processing wastes and continued operation of an onsite landfill will no longer be justified.

The Argentina plant is scheduled to startup as early as late 1996. However, the period of "shake-down" associated with a startup of a new plant, especially one employing brand new technology in an extreme climate 14,000 feet above sea-level, can be variable. A firm date to have the Argentina plant running at capacity sufficient to completely cease operations of the mine and extraction circuits can not be forecast with certainty. While FMC will begin phasing out the generation of tailings and mineral extraction wastes in Bessemer City in late 1996 or early 1997, the completion of the phase out may or may not be accomplished by January 1, 1998.

It is FMC's intention to cease operation of the landfill as soon as possible and by January 1, 1998. However, startup of the Argentina plant may delay FMC's ability to cease operations completely by that date. FMC would like to meet with Division of Solid Waste Management to review alternative means of compliance with the requirements of 15A NCAC 13B.

If you have any questions, or require additional information, please contact me at 704/868-0806.

Very truly yours,



Barbara E. Ritchie
Environmental Manager





Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
Permit No. 36-05
June 1996

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Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
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INTRODUCTION

In approximately 1954 Lithium Corporation of America ("Lithco") began operations on a tract of approximately 530 acres just west of Bessemer City, North Carolina. These operations consisted of the extraction and beneficiation of lithium from locally mined spodumene ore and processing of the extracted lithium to produce various lithium compounds. The extraction process, still in use today, includes decrepitation of the spodumene ore, acid roasting, neutralization and leach units to extract the lithium as aqueous lithium sulfate. The residual solid materials separated from the aqueous lithium sulfate and have been disposed on site since that time. These residual solids are known as depleted spodumene ore or "tailings."

Between 1954 and approximately 1975, the residual tailings were sluiced with water into two large surface impoundments, created when two dams were constructed in the southeastern ends of the property. By approximately 1975 these surface impoundments were largely filled and tailings could no longer be sluiced via gravity into the surface impoundments. Thus, large filters were installed to dry the residual solids and a belt conveyer installed to move the tailings to a staging pile. From the staging pile, the tailings are loaded onto trucks and transported to the onsite landfill, located primarily on top of the filled surface impoundments.

While the onsite landfill exists to allow for disposition of the mineral processing residues, and these materials represent by far the largest portion of the materials deposited in the landfill, other materials have been landfilled on site. These are described in Section II, waste characterization, and include ash from the coal-fired cogeneration boiler (installed in 1986), solids removed from the scrubbing system on the spodumene ore decrepitation kiln, and some miscellaneous non-hazardous industrial solid wastes. Currently, only tailings, ash, and kiln scrubbing solids are being disposed on site.

Historically, the onsite landfill has been managed so that the smaller volume materials, kiln scrubber solids and miscellaneous non-hazardous industrial wastes, are disposed in an area in the northwestern area of the landfill, while tailings and fly ash

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have been disposed throughout the landfill. Currently, tailings and fly ash are being disposed in the southeastern portions of the landfill, stacked on the No. 2 surface impoundment. Kiln scrubber solids continue to be managed in the northwestern area of the landfill.

The landfill was issued permit No. 36-05 in 1978 by the North Carolina Department of Human Resources, Division of Health Services, Sanitary Engineering Section, pursuant to North Carolina General Statute No. 130-166.18 and Public Law 94-580, passed in October 1976. Nonetheless, on occasion the classification of the landfill has been reviewed with respect as to whether it is best described as a solid waste landfill or a mining waste landfill. While tailings and kiln scrubber solids fall within the regulatory definition of mining waste, for purposes of minimization of administrative overlap, the landfill has continued to be regulated under the solid waste programs.

In 1985, FMC Corporation acquired Lithco and Solid Waste Landfill Permit No. 36-05 was transferred to FMC. The site continues to operate as FMC Corporation's Lithium Chemicals Division ("FMC").

The landfill is also regulated as a "solid waste management unit", or "SWMU" under FMC's Hazardous Waste Storage permit which contains corrective action provisions for all waste (not just hazardous waste) units at the facility. During the facility investigation conducted pursuant to the hazardous waste permit requirements, the landfill area was reviewed and included in the SWMU list as SWMU No. 5, the "Industrial Landfill," referring to the areas of tailings and fly ash disposal, and as SWMU No. 12, the "Sanitary Landfill," referring to the areas of the landfill used for kiln scrubber solids and miscellaneous non-hazardous industrial wastes.

In 1989 FMC's proposed groundwater monitoring plan was approved by the Division of Solid Waste Management and five groundwater monitoring wells, L-1 through L-5 were installed and have been monitored twice annually. Additionally three samples are collected from FMC's onsite stormwater canal system with the semiannual groundwater sampling events.

FMC's landfill is periodically inspected by the state for compliance with these rules. No violations have been noted during these inspections.

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WASTE CHARACTERIZATION

Ongoing Wastes

Wastes which continue to be disposed of in the solid waste landfill are:

1. Spodumene Ore Tailings
2. Ash from the Coal-fired Cogeneration plant
3. Decrepitation kiln scrubber solids

Characterizations and analytical information follows.

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SOLID WASTE & VECTOR CONTROL BRANCH

DATA COLLECTION SURVEY FORM FOR HAZARDOUS OR DIFFICULT TO HANDLE WASTE

PART A - GENERAL INFORMATION

- Item 1 - Facility Name Lithium Corporation of America
- Item 2 - Facility location Bessemer City, N.C. Hwy. 161
- Item 3 - Facility Owner Subsidiary of Gulf Resources & Chemical Corporation
- Item 4 - Facility Mailing Address Box 795
Bessemer City, N.C. 28016
- Item 5 - Facility Manager R.L. Nielsen Vice President Telephone No. 629-2282
- Item 6 - Facility Contact G.R. Scott Telephone No. 629-2282
- Item 7 - Time Period for Which Data is Representative 1975-1977
- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste Waste No. 1 (solid) (SPODUMENE FILTER CAKE)
- Item 2 - Origin of Waste Spodumene ore - LCA mine
- Item 3 - Quantity of Waste Generated Annually 120,000 tons/yr.
- Item 4 - Waste Composition See attached Product Bulletin
"SPODUMENE FILTER CAKE"
- Item 5 - Product Produced See figure 1 (attached)
- Item 6 - Quantity per Year Company Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage Land Stacking
- Item 2 - Quantity Stored 400 tons/day
- Item 3 - Frequency of Transfer to Storage Area daily
- Item 4 - Method of Transfer to Storage Area Conveyor-truck

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Conveyor-truck
- Item 2 - Source of Waste Lithium Corporation of America
- Item 3 - Quantity 400 tons/day
- Item 4 - Destination Land stacked behind Chemical Plant

PART E - TREATMENT METHODOLOGY

- Item 1 - Composition of Waste Treated See Product bulletin
"SPODUMENE FILTER CAKE"
- Item 2 - Quantity 400 tons/day
- Item 3 - Treatment Methods neutralization with limestone
- Item 4 - Equipment Used to Treat Waste neutralization tanks

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste SPODUMENE FILTER CAKE
- Item 2 - Composition of Waste See Product bulletin attached
- Item 3 - Quantity 400 tons/day
- Item 4 - Type of Disposal land stacked

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type NA

(b) Liner Thickness NA (c) Leachate Collection

NA (d) Distance from Waste to Ground Water

Item 6 - Operating Procedures: NA

(a) Land Site Security _____

(b) Method of Burial _____

(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples _____

F-2: Incineration Not Applicable for Solid Waste No. 1.

Item 1 - Type of Waste _____

Item 2 - Quantity _____

Item 3 - Composition _____

Item 4 - Type of Incinerator _____

Item 5 - Rated Capacity _____

Item 6 - Auxillary Fuel Used _____ Amount _____

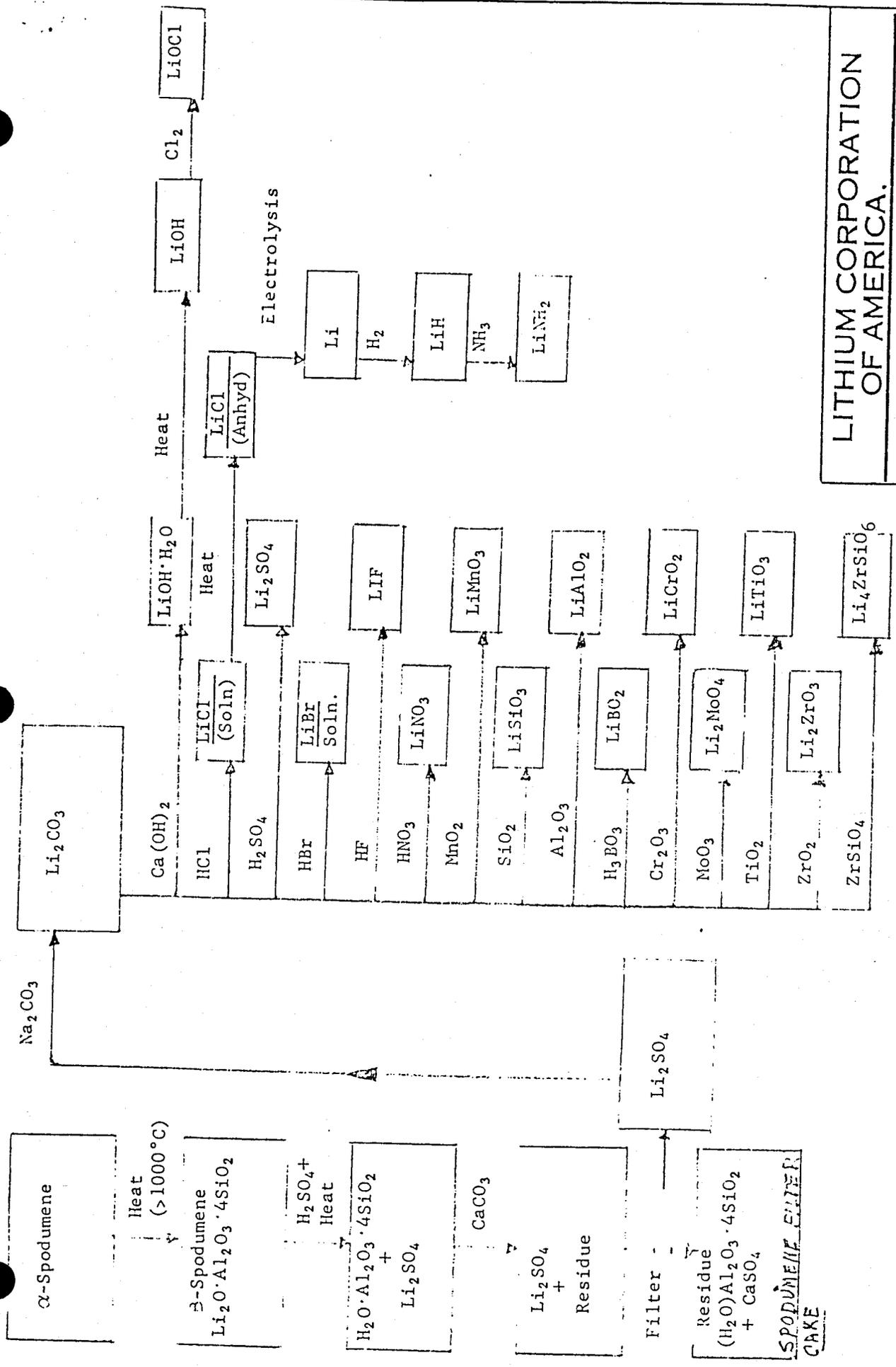
Item 7 - Design Specifications: (a) Temperature _____

(b) Dwell-Time _____ (c) Air Pollution Controls

Item 8 - Air Pollution Permit _____

Item 9 - Residue Disposal _____

Item 10 - Waste Storage Prior to Incineration _____



**LITHIUM CORPORATION
OF AMERICA.**

LOCATION - LCA Chemical Plant

DEPT. - Bessemer City, N.C.

PROJECT NO. - Figure 1

DWG. NO.

Figure No. 1

SPODUMENE FILTER CAKE

USE: Raw material for brick manufacture.

ORIGIN AND NATURE OF MATERIAL:

This by-product material is produced in the Ellestad—Leute process(U.S. Patent 2,516,109) in which α -spodumene ore is converted to β -spodumene by heating at 1100°C., and roasted with sulfuric acid to produce lithium sulfate, neutralized with limestone, and filtered to separate the solids from the lithium sulfate liquors.

The solid filter cake is essentially spodumene ore with its lithium sites substituted with hydrogen, mixed with calcium sulfate and calcium carbonate from the neutralization process. It is predominately an aluminum silicate, having consistent chemical composition and uniform particle size distribution from year to year. As removed from the filter circuit, this material contains approximately 25 to 30 percent water.

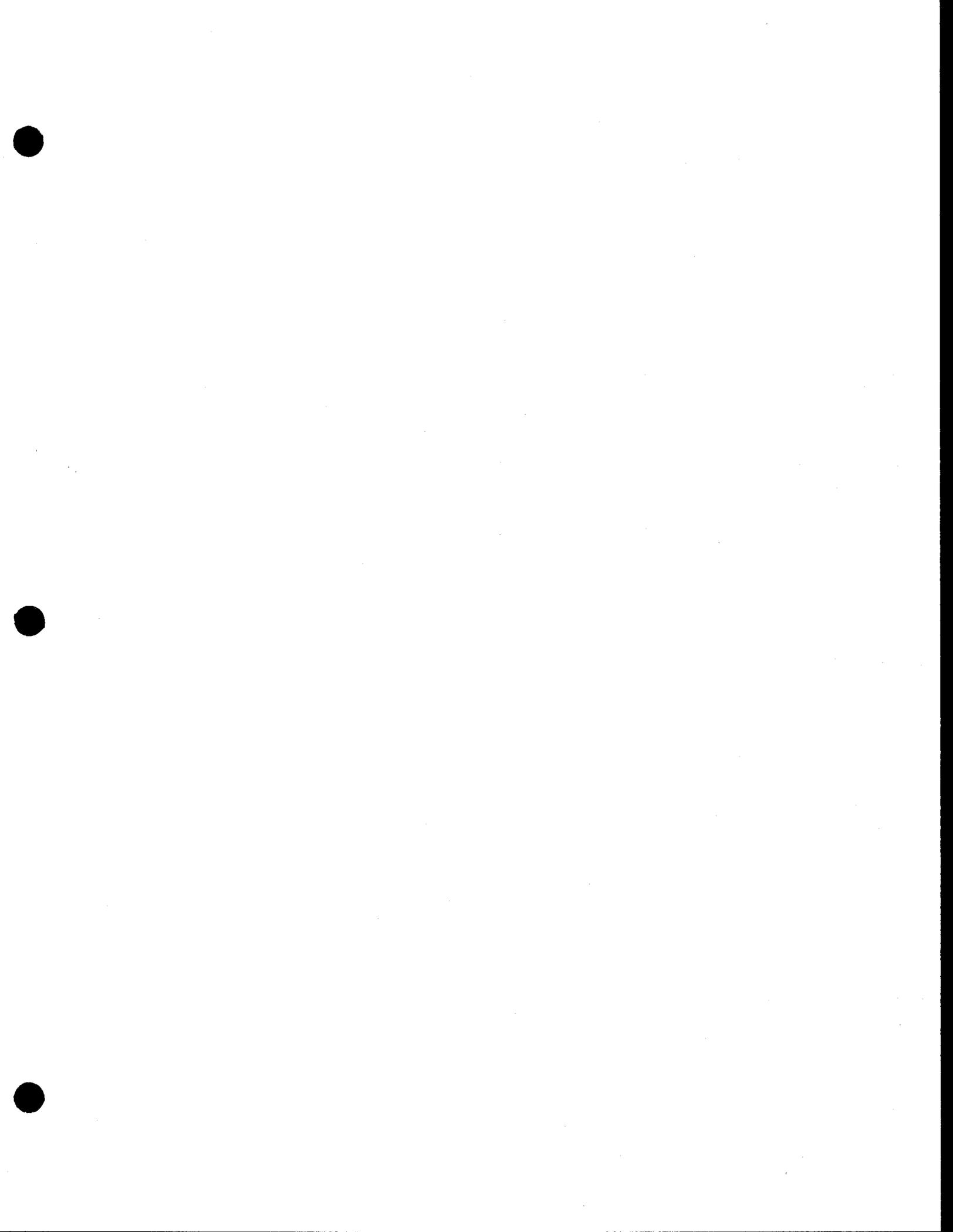
FIRING CHARACTERISTICS:

Process filter cake is a non-plastic aluminum silicate base mixture with a fine particle size distribution. It may be mixed with various bonding clays to produce light-colored brick of outstanding structural strength. Because of the finely ground nature and the chemical composition of this material, bricks with very smooth surface texture may be produced.* Combinations of this material with bonding clays may be used as the basic material for brick of variety of colors.

Spodumene Filter Cake may be mixed with auxiliary fluxes to produce practical fluxing additives. Possible auxiliary fluxes include glass, sodium silicate, feldspar, talc, bentonite, rasorite, and soda ash. The filter cake can be used as an additive to reduce cracking during the bricks' drying process. This material, when substituted for Seracite clay, substantially reduces cracking. The residual Li_2O values in this material improves thermal shock characteristics for most brick mixes. Mixtures containing this material as a component have shown reduced firing breakage losses.

Thermal decomposition of spodumene filter cake results in loss of CO_2 between 1400° to 1650°F. Sulfate decomposition to sulfur oxides does not occur below 2150°F. Most brick firing is done at or below this temperature and sulfur gas emissions are not a problem.

* Patent Applied For. Serial No. 562,354, March 26, 1975



TAILINGS MUD
(USA/Canada)
Effective 12/18/95
Replaces 04/12/91
Page 1 of 8

QS-MSD-019

I. PRODUCT IDENTIFICATION

Manufacturer: FMC Corporation, Lithium Division Regular Telephone: 704-868-5300
P.O. Box 795
Bessemer City, NC 28016-0795

EMERGENCY TELEPHONE NUMBERS

Trade Name: Tailings Mud Medical (Collect): 303-595-9048
Synonyms: Lithium Depleted Spodumene Ore Tailings Chemtrec: 800-424-9300
Chemical Formula: (See INGREDIENTS) Lithium Division: 704-629-5361
Chemical Family: Silicate Minerals
C.A.S. No.: Not applicable.
Canadian Product ID No.: None listed.
Product Use: Industrial Manufacturing

II. HAZARD LABEL STATEMENT

HEALTH HAZARDS: PROBABLE CARCINOGEN. May cause cancer on continuous exposure. Contains Quartz or Crystalline Silica.
RESPIRATORY IRRITANT. Prolonged inhalation of airborne dust can produce scar tissue in the lungs. The condition is not reversible.

PHYSICAL HAZARDS: None.

SPECIAL FIRE FIGHTING PROCEDURE: None. Material is non-combustible.

HANDLING AND STORAGE: Do not breathe dust and avoid getting in eyes. Keep container closed. Use with adequate ventilation. Drying and/or grinding may increase dusting hazards. Control dust levels in the work place.

II. HAZARD LABEL STATEMENT, CONTINUED

FIRST AID

Eyes: Immediately flush the eyes with plenty of water for at least fifteen minutes. If irritation occurs or persists, obtain medical attention.

Inhalation: Remove to fresh air. If breathing is difficult, give oxygen. If irritation occurs and persists, obtain medical attention.

III. INGREDIENTS

INGREDIENT EXPOSURE LIMITS

<u>Material or Component</u>	<u>C.A.S. No.</u>	<u>Wt. %</u>	<u>TLV Data</u>			
			<u>TWA</u> (OSHA)	<u>TWA</u> (ACGIH)	<u>STEL</u> (ACGIH)	<u>Ceiling</u> (OSHA)
Hydrated Aluminum Silicate	None	40	No applicable information was found.			
Hornblende, Dehydroxylated (Sodium, Calcium, Magnesium, Iron Aluminum Silicate)	None	5	No applicable information was found.			
Albite (Sodium Aluminum Silicate)	12244-10-9	2	No applicable information was found.			
Microcline (Potassium Aluminum Silicate)	12251-43-3	2	No applicable information was found.			
Silica (Quartz) (Silicon Dioxide Crystalline)	14808-60-7	2	0.1 mg/m ³ (respirable dust)	0.1 mg/m ³ (respirable dust)	*	*
Moisture	7732-18-5	25	No applicable information was found.			
Calcium Sulfate	10101-41-4	12	No applicable information was found.			
Calcium Carbonate	1317-65-3	12	No applicable information was found.			

*No applicable information was found.

III. INGREDIENTS, CONTINUED

INGREDIENT ANIMAL TEST DATA

<u>Material or Component</u>	<u>Canadian PIN</u>	<u>LD₅₀ Species and Route</u>	<u>LC₅₀ Species and Route</u>
Hydrated Aluminum Silicate	None	No applicable information was found.	
Hornblende Dehydroxylated (Sodium, Calcium, Magnesium, Iron Aluminum Silicate)	None	No applicable information was found.	
Albite (Sodium Aluminum Silicate)	None	No applicable information was found.	
Microcline (Potassium Aluminum Silicate)	None	No applicable information was found.	
Silica (Quartz) (Silicon Dioxide Crystalline)	None	No applicable information was found.	
Moisture	None	No applicable information was found.	
Calcium Sulfate	None	No applicable information was found.	
Calcium Carbonate	None	No applicable information was found.	

IV. PHYSICAL DATA

<u>PHYSICAL STATE:</u>	Solid.	<u>VAPOR DENSITY:</u>	Not applicable.
		Air = 1	
<u>APPEARANCE AND ODOR:</u>	Odorless, brown sand-like powder.	<u>VAPOR PRESSURE:</u>	Not applicable.
<u>ODOR THRESHOLD:</u>	Not applicable.	<u>FREEZING POINT/ MELTING POINT:</u>	>1400°C (>2550°F)
<u>BOILING POINT:</u>	Not applicable.	<u>SOLUBILITY IN WATER:</u>	Insoluble.
<u>DENSITY OR SPECIFIC GRAVITY:</u>	Approximately 2.5 g/cc	% by wt. @ 25°C (77°F)	
<u>VOLATILES:</u>	Not applicable.		

IV. PHYSICAL DATA, CONTINUED

EVAPORATION RATE: Not applicable. pH (1% Aqueous Slurry: Approximately 8
Butyl Acetate = 1 @ 25°C

COEFFICIENT OF WATER/OIL
DISTRIBUTION: Not applicable.

V. FIRE, EXPLOSION AND REACTIVITY DATA

PHYSICAL HAZARD: Non-combustible. NATIONAL FIRE PROTECTION CODE 704

FLASH POINT: Not applicable. Fire
(Red) (0)

AUTOIGNITION TEMPERATURE: Not applicable. Health
(Blue) (0) Reactivity
(Yellow) (0)

FLAMMABLE LIMITS IN AIR: Upper: Not applicable.
Lower: Not applicable.

EXTINGUISHING MEDIA: Any suitable for fire in surrounding area.

SPECIAL FIRE FIGHTING PROCEDURE: Not applicable.

UNUSUAL FIRE & EXPLOSION HAZARD: None.

HAZARDOUS COMBUSTION PRODUCTS: Not applicable.

EXPLOSION DATA: Non-explosive.

SENSITIVITY TO MECHANICAL IMPACT: Not applicable.

SENSITIVITY TO STATIC DISCHARGE: Not applicable.

STABILITY: Stable.

CONDITIONS CONTRIBUTING TO INSTABILITY: None.

INCOMPATIBILITY: None.

CONDITIONS OF REACTIVITY: None.

CONDITIONS CONTRIBUTING TO HAZARDOUS POLYMERIZATION: Does not polymerize.

VI. PRODUCT HEALTH HAZARD INFORMATION

PRODUCT HEALTH HAZARD:

PROBABLE CARCINOGEN. May cause cancer.

RESPIRATORY IRRITANT. Prolonged inhalation of airborne dust can produce scar tissue in the lungs. This condition is not reversible.

PRODUCT EXPOSURE LIMITS:

See INGREDIENTS, Section III.

ROUTE(S) OF EXPOSURE

HAZARD

PRODUCT TOX DATA and REFERENCE

Eye Contact:

May irritate the eyes.

No toxicology data available.

Inhalation:

Respirable particles of quartz are hazardous to inhale. May cause cancer.

No animal LC₅₀ toxicology data available.

EFFECTS OF OVEREXPOSURE

Acute Effects:

Possible irritation to the eyes.

Chronic Effects:

Respiratory Irritant. Chronic lung damage, scar tissue development in lungs can occur if inhaled over an extended period of time. Follow TLV exposure limits, Section III.

This product contains >0.1% silica and is therefore classified as a probable carcinogen. The International Agency for Research on Cancer (IARC 42, 1987) has concluded that there is sufficient evidence for the carcinogenicity of crystalline silica to experimental animals and limited evidence for the carcinogenicity to humans. Based on this and OSHA requirements, this necessitates the classification of the product as a probable carcinogen.

FIRST AID PROCEDURES

Eyes:

Immediately flush the eyes with plenty of water for at least fifteen minutes. If irritation occurs or persists, obtain medical attention.

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If irritation occurs and persists, obtain medical attention.

OTHER TOXICOLOGICAL PROPERTIES

Carcinogenicity:

Material is a probable carcinogen.

NTP Annual:

Not listed.

IARC Monograph:

Crystalline Silica (Quartz) is listed as a carcinogen to animals and there is limited evidence for the carcinogenicity to humans, Group 2A.

OSHA 29 CFR Part 1910 Subpart Z:

Not listed.

ACGIH (Appendix A):

Not listed.

VI. PRODUCT HEALTH HAZARD INFORMATION, CONTINUED

OTHER TOXICOLOGICAL PROPERTIES, CONTINUED

Irritancy: Silica is a respiratory irritant per OSHA, ACGIH and NIOSH and WHMIS.
Sensitization: No information available.
Teratogenicity: No information available.
Mutagenicity: No information available.

Any Medical Conditions Generally

Recognized as Being Aggravated by Exposure: Prior existing lung or respiratory illness.

VII. OTHER GOVERNMENTAL LISTINGS

SARA III SECTION 313: This product does not contain any toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

TSCA: Listed.

CERCLA: Not listed.

SECTION 302: Not listed.

RCRA: Not listed.

California Proposition 65: WARNING. California Safe Drinking Water and Toxics Enforcement Act of 1986 requires that the Government of California develop a list of carcinogens and reproductive toxins and that no persons doing business shall knowingly expose any individual to a chemical known to the state to cause cancer or reproductive toxicity without first giving clear and reasonable warning to such an individual. FMC would like you to know that our Tailings Mud contains the indicated concentration(s) of chemicals which are listed by California as chemicals known to cause cancer(A) or reproductive toxicity(B).

<u>Chemical</u>	<u>Concentration</u>	<u>Listed as (A), (B)</u>
Crystalline Silica (Quartz)	2%	(A)

Canadian (WHMIS)

Hazard Classification: Class D, Division 2, Subdivision A (Carcinogenicity and Respiratory Tract Sensitization)

Disclosure List: Silica is listed (1%).

VIII. DISPOSAL, SPILL OR LEAK PROCEDURES

PROCEDURE FOR RELEASE OR SPILL: Wet with water to reduce dusting and collect in a suitable container.

WASTE DISPOSAL METHOD: Dispose of waste according to federal EPA, state and local regulations.

IX. PERSONAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS: Provide adequate ventilation to maintain below exposure limits (Section III) for silica (quartz).

SPECIFIC PERSONAL PROTECTION EQUIPMENT

Respiratory: Wear a NIOSH/MSHA approved respirator when adequate ventilation is not available.
Eyes: Safety glasses or goggles.
Gloves: None.
Footwear: No special type indicated.
Clothing: No special type indicated.
Others: None.

X. HANDLING AND STORAGE

Do not breathe dust and avoid getting in eyes.
Keep container closed.
Use with adequate ventilation.
Drying and/or grinding may increase dusting hazards.
Control dust levels in the work place.

XI. TRANSPORTATION DATA

DOMESTIC

DOT Proper Shipping Name: Tailings Mud
DOT Classification: None
DOT Labels: Tailings Mud
DOT Placard: None
UN Number: None

FOREIGN

IMCO Proper Shipping Name: Tailings Mud
IMCO Hazard Classification: None
IMCO Labels: Tailings Mud
IMCO Marking: None

49 STCC NUMBER: None

EMERGENCY ACCIDENT

Precautions and Procedures: None

Precautions to be Taken in Transportation: No special precautions.

XI. TRANSPORTATION DATA, CONTINUED

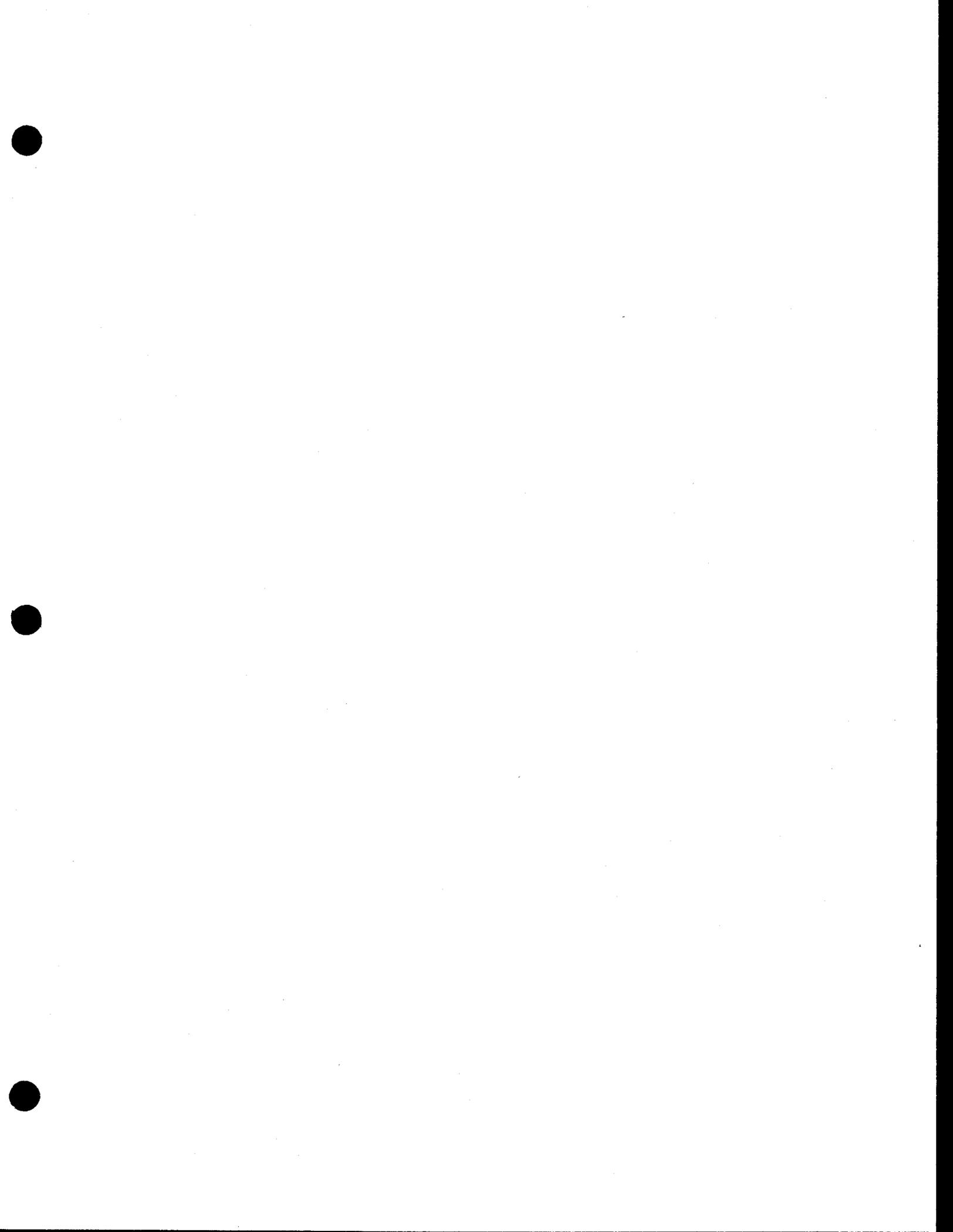
TYPE PACKAGES:

Bulk Truck

XII. CONTACT PERSON

Manager, Technical Services
FMC Corporation, Lithium Division
449 North Cox Road
P.O. Box 3925
Gastonia, North Carolina 28054-0020

704-868-5300





Pace Analytical

Pace Analytical Services, Inc.
9800 Kinsey Avenue, Suite 100
Huntersville, NC 28078

Tel: 704-875-9092
Fax: 704-875-9091

Ms. Barbara Ritchie
Page 3

March 01, 1996
PACE Project Number: 660131505

Client Reference: Metals Analysis

PACE Sample Number:
Date Collected:
Date Received:
Client Sample ID:
Parameter

92 0543637
01/31/96
01/31/96
Ore

Units MDL Tailings DATE ANALYZED

INORGANIC ANALYSIS

RCRA METALS

Arsenic	mg/kg	0.50	8.7	02/19/96
Barium	mg/kg	2.0	6.0	02/27/96
Cadmium	mg/kg	1.0	ND	02/27/96
Chromium	mg/kg	1.0	7.4	02/27/96
Lead	mg/kg	0.50	3.3	02/21/96
Mercury	mg/kg	0.040	0.16	02/19/96
Selenium	mg/kg	0.50	ND	02/15/96
Silver	mg/kg	0.50	ND	02/27/96

REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, Inc.

Pace Analytical

Pace Analytical Services, Inc.
9800 Kincay Avenue, Suite 100
Huntersville, NC 28078

Tel: 704-875-9092
Fax: 704-875-9091

Ms. Barbara Ritchie
Page 8

March 01, 1996
PACE Project Number: 660131505

Client Reference: Metals Analysis

PACE Sample Number:
Date Collected:
Date Received:
Client Sample ID:

92 0543645
01/31/96
01/31/96
Ore

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>Tailings leachate (4)</u>	<u>DATE ANALYZED</u>
<u>INORGANIC ANALYSIS</u>				
TCLP RCRA TOXICITY METALS				
Arsenic	mg/L	0.005	ND	02/19/96
Barium <i>100 RCRA</i>	mg/L	0.02	0.13	02/26/96
Cadmium	mg/L	0.010	ND	02/26/96
Chromium	mg/L	0.010	ND	02/26/96
Lead	mg/L	0.10	ND	02/26/96
Mercury	mg/L	0.0002	ND	02/19/96
Selenium	mg/L	0.005	ND	02/16/96
Silver	mg/L	0.005	ND	02/26/96

RCRA Metals in Liquids
Analytical Methods:

Barium, Cadmium, Chromium, Lead, Silver - EPA 200.7
Arsenic, Selenium - EPA 200.9
Mercury - EPA 245.1

Digestion Methods:

Mercury - EPA 245.1
All Others - 200.2

These data have been reviewed and are approved for release.


Dan H. Jones
Inorganic Department

REPORT OF LABORATORY ANALYSIS

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STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Ash from Coal Fired Boiler
3. What volume of disposal will there be? 40,000 ft³(5,000 tons)(annually)
4. What frequency of disposal will there be? 3,333 ft³ (417 tons) (monthly)
5. Explain either the manufacturing process or how the waste was generated.
This ash is from our new coal fired boiler.

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
2. What other constituents are present and in what concentration? (Attach
lab results.) Ash
- * 3. What is the moisture content? 10%
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Truck

"I hereby certify that the information submitted in regard to
Boiler Ash (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie, Jr.
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

SAMPLE SOURCES

BILL TO: Lithium Corporation of America
P. O. Box 795, Hwy 161
Bessemer City, N. C. 28016
ATTN: Mr. William S. Kane
G.R. SCOTT

P.O. # _____ SAMPLE TYPE _____ GRAB _____ COMPOSITE _____

WASTEWATER _____

DATE SAMPLED 10-05-86

SLUDGE _____

COLLECTED BY Joe Ratchford/GKS

OIL _____

REMARKS Ash from

LEACHATE _____

Ce-Gen System

OTHER _____

X

No. 161

Do not pay if

this copy

PARAMETER	RESULTS	DATE ANALYZED	ANALYST	METHOD OF ANALYSIS	CHARGE
<u>ICLCP - Metals</u>					
Arsenic, As	<0.05	10/14	DF	206.2	
Barium, Ba	<0.5	10/14	JK	208.2	
Cadmium, Cd	<0.01	10/13	DF	213.1	
Chromium, Cr	<0.05	10/13	DF	218.1	
Lead, Pb	<0.05	10/13	DF	239.1	
Mercury, Hg	<0.002	10/16	DF	245.1	
Selenium Se	<0.01	10/14	DF	270.2	
Silver, Ag	<0.01	10/13	DF	272.1	

Regulatory Level (5 mg/l)

All results reported in mg/l unless otherwise noted.

DATA REVIEWED BY: Judy Kidd



Mr. Gerald R. Scott
Page 5

June 05, 1996
PACE Project Number: 660522504

Client Reference: FMC/ Lithium Div.

PACE Sample Number: 92 0602641
Date Collected: 05/21/96
Date Received: 05/22/96
Client Sample ID: Fly Ash
Parameter Units MDL Leachate DATE ANALYZED
(1)

INORGANIC ANALYSIS

TCLP RCRA TOXICITY METALS

Arsenic	mg/L	0.005	0.005	05/28/96
Barium	mg/L	0.010	0.52	05/29/96
Cadmium	mg/L	0.010	ND	05/29/96
Chromium	mg/L	0.010	ND	05/29/96
Lead	mg/L	0.10	ND	05/29/96
Mercury	mg/L	0.0002	ND	06/01/96
Selenium	mg/L	0.005	0.006	05/29/96
Silver	mg/L	0.010	0.033	05/29/96

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.



REPORT OF LABORATORY ANALYSIS

September 06, 1995
 PACE Project Number: 6508185

Mr. Gerald R. Scott
 Page 5

Client Reference: TCLP Metals

PACE Sample Number:
 Date Collected:
 Date Received:
 Client Sample ID:
 Parameter

92 0456564
 08/15/95
 08/18/95
 Coal Ash
 Leachate
 (1) DATE ANALYZED

Units MDL

INORGANIC ANALYSIS

TCLP RCRA TOXICITY METALS

Parameter	Units	MDL	Leachate	DATE ANALYZED
Arsenic	mg/L	0.005	ND	08/27/95
Barium	mg/L	0.010	0.490	09/01/95
Cadmium	mg/L	0.010	ND	09/01/95
Chromium	mg/L	0.010	ND	09/01/95
Lead	mg/L	0.10	ND	09/01/95
Mercury	mg/L	0.0002	ND	08/25/95
Selenium	mg/L	0.005	ND	08/26/95
Silver	mg/L	0.005	ND	09/01/95

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Decrepitation Kiln Scrubber Solids
3. What volume of disposal will there be? 10,000 ft³(500 tons)
4. What frequency of disposal will there be? Annually
5. Explain either the manufacturing process or how the waste was generated. The solids are collected from the exhaust of the decrepitation kiln by a wet scrubbing system.

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
2. Does the waste exhibit any of the four characteristics as defined by .0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No (Lab Results Attached)

INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in .0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach lab results.)

2. What other constituents are present and in what concentration? (Attach lab results.) 83% Spodumene Ore, 1% Aluminum Fluoride, and less than 0.5% Hydrofluoric Acid. Acidity is quickly neutralized by excess CaCO₃ in the landfill.
- * 3. What is the moisture content? 15%
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e., barrels, bags, etc.)? Truck

"I hereby certify that the information submitted in regard to Decrepitation Scrubber Solids (name of waste) is true and correct to the best of my knowledge and belief."

Arthur S. Gillespie
(signature)

All questions concerning this "Procedure" should be directed to Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

EMS Laboratories, Inc.

4132 POMPADRO DRIVE
CHARLOTTE, NORTH CAROLINA 28216
(704) 392-6276

REPORT
NUMBER

SAMPLE SOURCES

Fines

Ki'in Scrubber

BILL TO:

Lithium Corporation of America
P.O. Box 795
Bessemer City, N.C. 28016
Att: Mr. Gerald R. Scott

No. 00885

Do not pay from
this copy

REPORT DATE 6/17/86

DATE RECEIVED

EMS SAMPLE # 1012-2

P.O. # 85378

SAMPLE TYPE GRAB COMPOSITE

WASTEWATER

DATE SAMPLED

4-28-86

SLUDGE

COLLECTED BY

4-28-86 GRS

OIL

REMARKS

LEACHATE

OTHER

DATE ANALYZED

ANALYST

METHOD OF ANALYSIS

CHARGE

EP TOXICITY - Leachate

Arsenic, As	0.09
Barium, Ba	<0.5
Cadmium, Cd	<0.01
Chromium, Cr	<0.05
Lead, Pb	<0.05
Mercury, Hg	<0.001
Selenium, Se	<0.01
Silver, Ag	<0.01

6/11/86	DF
6/12/86	DF
6/4/86	DF
6/3/86	DF
6/4/86	DF
6/13/86	DF
6/11/86	DF
6/3/86	DF

206.2
208.2
213.1
218.1
239.1
245.1
270.2
272.1

All results in mg/L

total

\$249.00

DATA REVIEWED

Judy Skid

REPORT COPY

IN SITU OF SAMPLES OF SLUDGE COLLECTED FROM POND KILN ↓

Table 6-11
Analytical Results
SWMU 6

Parameter	DC-1			DC-2			SW-1		SED-1		SB-1:0'-2'	SB-1:8'-10'	SB-1:18'-20'
	3/94	6/94	9/94	3/94	6/94	9/94	3/94	9/94	3/94	9/94	3/94	3/94	3/94
General/Inorganics													
pH	5.06	4.74	4.92	4.74	4.96	4.89	5.14	4.51	3.01	2.35			
Specific Conductivity	2370	2100	2220	2100	55	39	33	36	6610	1055			
Temperature	17.4	17.8	18.2	17.8	17.2	17.9	18.3	17.8	26.8	30.2			
Turbidity		>1000	>200	>400		>1000	>200	>400					
TDS		2300				<16							
Chloride	170	180	280	190	2.4	3	2.7	2.4	180	330	43	<10	<10
Cyanide													
Fluoride	15	11	13	21	<0.1	<0.1	<0.1	<0.1	0.1	58	7	<1	<1
Sulfate	1200	1300	1200	1100	5.3	4.6	4.4	2.4	4400	7100	780	24	35
Sulfide													
Metals, Total													
Antimony	100	44	50.1	72.7	47	210	7.4 B	285	1300.3	1090	25000	9200	4300
Arsenic	0.1	<0.2	0.141 B	0.248	0.047	3	0.61	0.694	0.62	0.609	20	<20	20
Barium	0.89	0.058	0.0835	0.0616	4	0.025	0.027 B	0.007	0.44	0.761	1.8	1.2	1.2
Beryllium	0.078	<0.005	0.0018 B	0.0015 B	<0.005	<0.005	<0.001	<0.001	0.02	0.0347	<0.5	<0.5	<0.5 V
Cadmium						4.4							
Calcium	0.25	0.06	0.0563	0.149	1.1	0.71	0.0115	0.421	1.2	1.82	64	84	59
Chromium													
Cobalt													
Copper													
Lead	48	9	18.5	17.6	1000	540	57.6	175	45	109	14000	17000	16000
Lithium	50	55	49.4	52	<0.0006	0.42	0.0307 BV	0.202	270	313 V	240	2.4	1.8
Mercury	0.4	<0.2	0.21	0.26	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<100	<100	<100
Nickel													
Selenium	<5	<5	6	4.6 BV	<5	<5	<2	4.6 B	36	109 S	<500	<500	<500
Silver	<0.01	<0.01	<0.001 V	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	0.004 B	<5	<5 V	<5
Thallium													
Tin													
Vanadium													
Zinc													
Metals, filtered													
Antimony, filtered													
Arsenic, filtered	<10	<10	21.2	22.6	<10	<10	3.1 B	<2					
Barium, filtered	<0.2	<0.2	0.0191 B	0.0194 B	<0.2	<0.2	0.0314 B	0.0278 B					
Beryllium, filtered	0.033	0.031	0.0435	0.049	<0.005	<0.005	<0.001	<0.001					
Cadmium, filtered	<0.005	<0.005	0.0024 B	0.0017 B	<0.005	<0.005	<0.001	<0.001					
Chromium, filtered	<0.01	<0.01	<0.001	0.016	<0.01	<0.01	<0.001	<0.001					

Table 6-11
Analytical Results
SWMU 6

Parameter	DC-1		DC-2		SW-1		Units	SED-1		SB-1:0'-2' 3/94	SB-1:8'-10' 3/94	SB-1:18'-20' 3/94
	3/94	6/94	9/94	12/94	3/94	9/94		3/94	9/94			
Benzene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	6
Bromodichloromethane	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Bromolorm	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Bromomethane /Methyl Bromide	<10	<10	<10	<10	<10	<10	µg/l	<14	<14 V	<10	<10	<10
Carbon disulfide	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Carbon Tetrachloride	<5	<5	<5	<5	<5	<5	µg/l	<7	<7 V	<5	<5	<5
Chlorobenzene	<5	<5	<5	<5	<5	<5	µg/l	<14	<14 V	<10	<10	<10
Chloroethane	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Chloroform	<10	<10	<10 V	<10	<10	<10	µg/l	<14	<14	<10	<10	<10
Chloromethane /Methyl Chloride	<10	<10	<10 V	<10	<10	<10	µg/l	<14	<14	<10	<10	<10
Cis-1,2-Dichloroethene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Cis-1,3-Dichloropropene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Dibromochloromethane	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Dibromomethane	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Ethyl Methacrylate	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Ethylbenzene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Iodomethane	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Methacrylonitrile	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Methyl Methacrylate	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Methylene chloride	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Pentachloroethane	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Styrene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Tetrachloroethene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Toluene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Trans-1,2-Dichloroethene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Trans-1,3-Dichloropropene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Trans-1,4-Dichloro-2-Butene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Trichloroethene	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5
Trichlorofluoromethane	<5 JV	µg/l	<7	<7	<5	<5	<5					
Vinyl acetate	<10	<10	<10	<10	<10	<10	µg/l	<14	<14	<10	<10	<10
Vinyl chloride	<10	<10	<10	<10	<10	<10	µg/l	<14	<14	<10	<10	<10
Xylene, total	<5	<5	<5	<5	<5	<5	µg/l	<7	<7	<5	<5	<5

Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
Permit No. 36-05
June 1996

Historical Wastes

Attached are all the waste characterizations forms on file for materials which have been historically disposed of in the onsite landfill.



1977 APPLICATION
SOME WASTES ARE
APPLICABLE IN 1989

December 1, 1977

Mr. C. Rick Doby
District Sanitarian
N. C. Division of Human Resources
405 Windsor Drive
Salisbury, N. C. 28144

Dear Mr. Doby:

Enclosed herewith are the questionnaires supporting the application for a permit for disposal of solid waste by landfilling at our Bessemer City Chemical Plant. Included in this list of questionnaires are the following:

1. The check off sheet for the proposed sanitary landfill site.
2. A data collection survey form for the solid waste material remaining from our butyllithium muds incineration.
3. A data collection survey form for the spodumene filter cake or lithium ore residues disposed.
4. A data collection survey form for miscellaneous solids such as metal and fiber drums, used carbon anodes, wood pallets, paper, etc.
5. A data collection survey form for solid muds from the chlorine recovery unit.
6. A data collection survey form for solid wastes from the lithium metal production building.
7. A data collection survey form for solid waste from the lithium bromide production.
8. A data collection survey form for solid waste materials from the area of lithium chloride production.
9. An areial photo of the area.

I point out that we do on several of these questionnaires list soluble salts such as LiCl , NaCl and Na_2SO_4 . Actually the amount of these soluble species is a small part of the waste listed in each case.

We made some Poloroid pictures but they simply are not satisfactory for sending. Rather than further delay this, we will plan to take some good color shots and mail them to you later.

I apologize for the delay in returning these forms to you.

Mr. C. Rick Doby
December 1, 1977
Page 2

If you have further questions, please contact me or Mr. Gerald Scott in our Research Department at Bessemer City.

Sincerely yours,

Arthur S. Gillespie, Jr.

Arthur S. Gillespie, Jr.
Director, Corporate Services

ASG/ah

Enclosures

cc: J. W. Setzer
G. R. Scott
H. E. Uhland

N. C. STATE BOARD OF HEALTH
CHECK-OFF SHEET FOR PROPOSED SANITARY LANDFILL SITES

COUNTY Gaston LOCATION Hwy. 161 Bessemer City, N.C. 28016 ACRES 30
 PROPERTY OWNER Lithium Corporation of America PROPOSED OPERATOR Bob Tumbleson

1. Is this site within the boundaries of a public water supply watershed? Watershed _____ YES _____ NO x
2. Does any portion of this site contain floodplain areas? YES _____ NO x
3. Are there public or private wells nearby that could be affected? YES _____ NO x
 Nearest well in feet _____ (Elaborate in Comments Section)
4. Are there springs present on the site? Number _____ YES _____ NO x
5. Will this site require dyking? YES _____ NO x
6. Will this site require piping of surface drainage? YES _____ NO x
7. Not precluding required boring information, does this site have adequate cover material for the sanitary landfill development? YES x NO _____
8. Will this site require diversion of surface water? YES _____ NO x
 Receiving stream for surface drainage from site Abernathy Creek
9. Will this site require extensive preparation, such as clearing? YES _____ NO x
 (Elaborate in Comments Section)
10. Will this site require a new all-weather access road? YES _____ NO x
 (Elaborate in Comments Section)

Evaluate the following:

	POOR	GOOD	EXCELLENT
A. Surface soil conditions as related to cover requirements	_____	_____	_____ <u>x</u>
B. Location as related to population density	_____	_____	_____ <u>x</u>
C. Accessibility to users	_____	_____	_____ <u>x</u>

2. Based on the observations made above and otherwise, do you recommend that the requestor proceed with the requirements of Section IX of the North Carolina State Board of Health "Rules and Regulations Providing Standards for Solid Waste Disposal"?
 YES _____ NO _____

3. COMMENTS: (Include any requirements noted by you for the sanitary landfill development and operation)

- Number of borings recommended for a representative sampling of the site _____
- Percent of usable land _____. Include sketch of site on back of this form.

 (DATE)
 RM 1350 (1/72)
 Sanitary Engineering

 N. C. State Board of Health
 District Sanitarian for Solid Waste
 or
 Sanitary Engineer

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SOLID WASTE & VECTOR CONTROL BRANCH

DATA COLLECTION SURVEY FORM FOR HAZARDOUS OR DIFFICULT TO HANDLE WASTE

PART A - GENERAL INFORMATION

- Item 1 - Facility Name Lithium Corporation of America
- Item 2 - Facility location Hwy. 161 Bessemer City, NC
- Item 3 - Facility Owner Subsidiary of Gulf Resources & Chemical Corporation
- Item 4 - Facility Mailing Address Box 795
Bessemer City, NC 28016
- Item 5 - Facility Manager R.L. Nielsen Telephone No. 629-2282
- Item 6 - Facility Contact Gerald R. Scott Telephone No. 629-2282
- Item 7 - Time Period for Which Data is Representative 1976-1977
- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. - 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500

PART B - WASTE CHARACTERIZATION (See Incineration F-2 pg. 3 of 3)

- Item 1 - Type of Waste Process Sludge
- Item 2 - Origin of Waste Butyllithium Production
- Item 3 - Quantity of Waste Generated Annually 7500 lbs/yr.
- Item 4 - Waste Composition Lithium Metal, Lithium Chloride and Organic Solvents.
Plus some filter aid. Only the filter aid is land disposed.
- Item 5 - Product Produced Butyllithium
- Item 6 - Quantity per Year Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage _____
- Item 2 - Quantity Stored _____
- Item 3 - Frequency of Transfer to Storage Area _____
- Item 4 - Method of Transfer to Storage Area _____

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation 55 Gallon Drums
- Item 2 - Source of Waste _____
- Item 3 - Quantity Approximately 10 drums/day
- Item 4 - Destination _____

PART E - TREATMENT METHODOLOGY

- Item 1 - Composition of Waste Treated See Part B, Item 4

- Item 2 - Quantity _____
- Item 3 - Treatment Methods Organic solvents drained off and used as fuel.
Sludge is incinerated to recover lithium values. Filter aid is buried.
- Item 4 - Equipment Used to Treat Waste _____

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste Filter aid from above
- Item 2 - Composition of Waste Filter aid (diatomaceous earth)

- Item 3 - Quantity _____
- Item 4 - Type of Disposal _____

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type _____
(b) Liner Thickness _____ (c) Leachate Collection _____
_____ (d) Distance from Waste to Ground Water _____

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial _____
(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples _____

F-2: Incineration

Item 1 - Type of Waste Waste No. 2 (Liquid) Solvent
Item 2 - Quantity 34,000 gallons/year
Item 3 - Composition Hexane from butyllithium process

Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used None Amount —
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controis _____

Item 8 - Air Pollution Permit Gaston County Certificate No. 85
Item 9 - Residue Disposal Recycled. See drawing attached.
Item 10 - Waste Storage Prior to Incineration 55 gal. drums

LCA'S BUTYLLITHIUM MANUFACTURE AND
BY PRODUCT RECOVERY

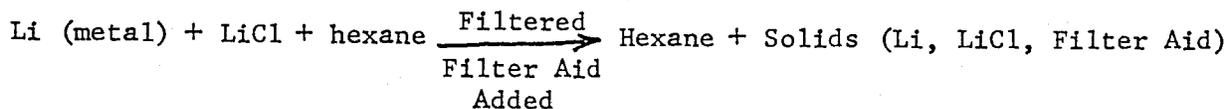
1. BASIC REACTION

Butyl chloride + Lithium metal \rightarrow Butyllithium + LiCl

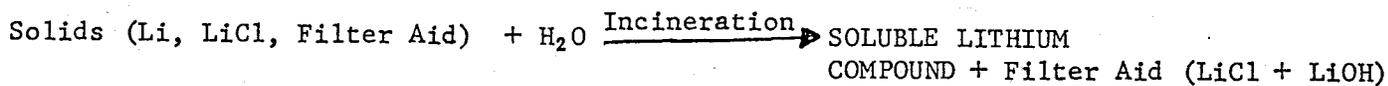


Butyllithium is removed as a gas. In the reaction vessel there remains a mixture of hexane, unreacted lithium metal and lithium chloride

2. SEPARATION OF SOLIDS FROM HEXANE



3. SOLIDS RECOVERY AND FILTER AID DISPOSAL



4. Lithium Values are recovered by filtration and the remaining filter aid (small) is land disposed (buried).

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SOLID WASTE & VECTOR CONTROL BRANCH

DATA COLLECTION SURVEY FORM FOR HAZARDOUS OR DIFFICULT TO HANDLE WASTE

PART A - GENERAL INFORMATION

- Item 1 - Facility Name Lithium Corporation of America
- Item 2 - Facility location Bessemer City, N.C. Hwy. 161
- Item 3 - Facility Owner Subsidiary of Gulf Resources & Chemical Corporation
- Item 4 - Facility Mailing Address Box 795
Bessemer City, N.C. 28016
- Item 5 - Facility Manager R.L. Nielsen Vice President Telephone No. 629-2282
- Item 6 - Facility Contact G.R. Scott Telephone No. 629-2282
- Item 7 - Time Period for Which Data is Representative 1975-1977
- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste Waste No. 1 (solid) (SPODUMENE FILTER CAKE)
- Item 2 - Origin of Waste Spodumene ore - LCA mine
- Item 3 - Quantity of Waste Generated Annually 120,000 tons/yr.
- Item 4 - Waste Composition See attached Product Bulletin
"SPODUMENE FILTER CAKE"
- Item 5 - Product Produced See figure 1 (attached)
- Item 6 - Quantity per Year Company Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage Land Stacking
- Item 2 - Quantity Stored 400 tons/day
- Item 3 - Frequency of Transfer to Storage Area daily
- Item 4 - Method of Transfer to Storage Area Conveyor-truck

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Conveyor-truck
- Item 2 - Source of Waste Lithium Corporation of America
- Item 3 - Quantity 400 tons/day
- Item 4 - Destination Land stacked behind Chemical Plant

PART E - TREATMENT METHODOLOGY

- Item 1 - Composition of Waste Treated See Product bulletin
"SPODUMENE FILTER CAKE"
- Item 2 - Quantity 400 tons/day
- Item 3 - Treatment Methods neutralization with limestone
- Item 4 - Equipment Used to Treat Waste neutralization tanks

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste SPODUMENE FILTER CAKE
- Item 2 - Composition of Waste See Product bulletin attached
- Item 3 - Quantity 400 tons/day
- Item 4 - Type of Disposal land stacked

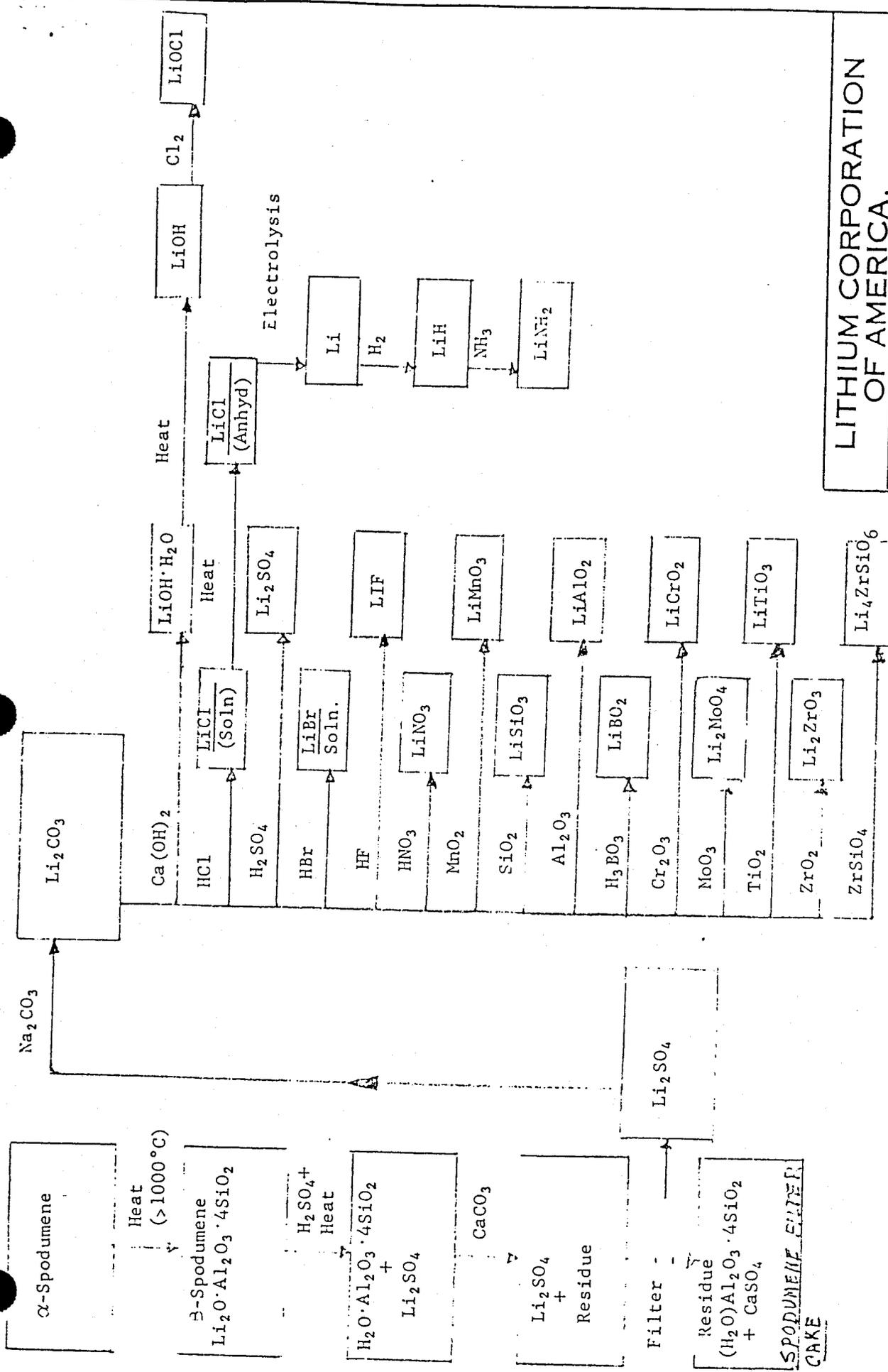
F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type NA
(b) Liner Thickness NA (c) Leachate Collection
NA (d) Distance from Waste to Ground Water

Item 6 - Operating Procedures: NA
(a) Land Site Security _____
(b) Method of Burial _____
(c) Leachate Treatment Procedures _____
(d) Type of Analysis Performed on Leachate and Ground Water Samples _____

F-2: Incineration Not Applicable for Solid Waste No. 1.

Item 1 - Type of Waste _____
Item 2 - Quantity _____
Item 3 - Composition _____
Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used _____ Amount _____
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controls _____
Item 8 - Air Pollution Permit _____
Item 9 - Residue Disposal _____
Item 10 - Waste Storage Prior to Incineration _____



**LITHIUM CORPORATION
OF AMERICA.**

LOCATION - LCA Chemical Plant

DEPT. - Bessemer City, N.C.

PROJECT NO. - Figure 1

DWG. NO.

Figure No. 1

SPODUMENE FILTER CAKE

USE: Raw material for brick manufacture.

ORIGIN AND NATURE OF MATERIAL:

This by-product material is produced in the Ellestad—Leute process (U.S. Patent 2,516,109) in which α -spodumene ore is converted to β -spodumene by heating at 1100°C., and roasted with sulfuric acid to produce lithium sulfate, neutralized with limestone, and filtered to separate the solids from the lithium sulfate liquors.

The solid filter cake is essentially spodumene ore with its lithium sites substituted with hydrogen, mixed with calcium sulfate and calcium carbonate from the neutralization process. It is predominately an aluminum silicate, having consistent chemical composition and uniform particle size distribution from year to year. As removed from the filter circuit, this material contains approximately 25 to 30 percent water.

FIRING CHARACTERISTICS:

Process filter cake is a non-plastic aluminum silicate base mixture with a fine particle size distribution. It may be mixed with various bonding clays to produce light-colored brick of outstanding structural strength. Because of the finely ground nature and the chemical composition of this material, bricks with very smooth surface texture may be produced.* Combinations of this material with bonding clays may be used as the basic material for brick of variety of colors.

Spodumene Filter Cake may be mixed with auxiliary fluxes to produce practical fluxing additives. Possible auxiliary fluxes include glass, sodium silicate, feldspar, talc, bentonite, rasorite, and soda ash. The filter cake can be used as an additive to reduce cracking during the bricks' drying process. This material, when substituted for Seracite clay, substantially reduces cracking. The residual Li_2O values in this material improves thermal shock characteristics for most brick mixes. Mixtures containing this material as a component have shown reduced firing breakage losses.

Thermal decomposition of spodumene filter cake results in loss of CO_2 between 1400° to 1650°F. Sulfate decomposition to sulfur oxides does not occur below 2150°F. Most brick firing is done at or below this temperature and sulfur gas emissions are not a problem.

* Patent Applied For. Serial No. 562,354, March 26, 1975

N. C. DEPARTMENT OF HUMAN RESOURCES
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- Item 3 - Facility Owner LCA - Subsidiary Gulf Resources & Chemical Corporation
- Item 4 - Facility Mailing Address Box 795
Bessemer City, N.C. 28016
- Item 5 - Facility Manager R.L. Nielsen Telephone No. 629-2282
- Item 6 - Facility Contact Gerald R. Scott Telephone No. 629-2282
- Item 7 - Time Period for Which Data is Representative 1975-1977
- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500
Discharge water is treated in a licensed wastewater facility.

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste Miscellaneous solids
- Item 2 - Origin of Waste Many locations in and around the chemical plant
- Item 3 - Quantity of Waste Generated Annually 12.5 Tons/yr.
- Item 4 - Waste Composition: Metal and fiber drums, used carbon anodes,
wooden pallets
- Item 5 - Product Produced _____
- Item 6 - Quantity per Year _____

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage _____
- Item 2 - Quantity Stored _____
- Item 3 - Frequency of Transfer to Storage Area Daily
- Item 4 - Method of Transfer to Storage Area Truck

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Truck
- Item 2 - Source of Waste _____
- Item 3 - Quantity _____
- Item 4 - Destination Landfill

PART E - TREATMENT METHODOLOGY DNA

- Item 1 - Composition of Waste Treated _____

- Item 2 - Quantity _____
- Item 3 - Treatment Methods _____

- Item 4 - Equipment Used to Treat Waste _____

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste Miscellaneous solids
- Item 2 - Composition of Waste See Part B-Item 4
- Item 3 - Quantity 12.5 Tons/yr.
- Item 4 - Type of Disposal Burial - cover with ore tailings

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type _____
(b) Liner Thickness _____ (c) Leachate Collection
_____ (d) Distance from Waste to Ground Water

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial _____
(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples

F-2: Incineration DNA

Item 1 - Type of Waste _____
Item 2 - Quantity _____
Item 3 - Composition _____

Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used _____ Amount _____
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controls

Item 8 - Air Pollution Permit _____
Item 9 - Residue Disposal _____
Item 10 - Waste Storage Prior to Incineration _____

SOME CHANGES MADE IN 1987 MADE APPLICATION

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SOLID WASTE & VECTOR CONTROL BRANCH

DATA COLLECTION SURVEY FORM FOR HAZARDOUS OR DIFFICULT TO HANDLE WASTE

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- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500
Discharge water is treated in a licensed wastewater facility.

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste solids - muds
- Item 2 - Origin of Waste wastes from chlorine recovery unit
- Item 3 - Quantity of Waste Generated Annually 18 Tons/year
- Item 4 - Waste Composition 5% CaSO₄, 80% Li₂CO₃ 5% K₂SO₄ and 10% Na₂SO₄
(all are approximated)
- Item 5 - Product Produced Lithium Hypochlorite
- Item 6 - Quantity per Year Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage 55 gallon drums
- Item 2 - Quantity Stored _____
- Item 3 - Frequency of Transfer to Storage Area Weekly
- Item 4 - Method of Transfer to Storage Area Truck

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Truck
- Item 2 - Source of Waste See Part B-Item 2
- Item 3 - Quantity —
- Item 4 - Destination Landfill, cover with ore tailings

PART E - TREATMENT METHODOLOGY DNA

- Item 1 - Composition of Waste Treated _____

- Item 2 - Quantity _____
- Item 3 - Treatment Methods _____

- Item 4 - Equipment Used to Treat Waste _____

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste Solids
- Item 2 - Composition of Waste See Part B-Item 4
- Item 3 - Quantity See Part B-Item 3
- Item 4 - Type of Disposal Burial - Landfill - cover

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type _____
(b) Liner Thickness _____ (c) Leachate Collection _____
_____ (d) Distance from Waste to Ground Water _____

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial _____
(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples _____

F-2: Incineration DNA

Item 1 - Type of Waste _____
Item 2 - Quantity _____
Item 3 - Composition _____

Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used _____ Amount _____
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controls _____

Item 8 - Air Pollution Permit _____
Item 9 - Residue Disposal _____
Item 10 - Waste Storage Prior to Incineration _____

NOT NOW
APPLICABLE (1989)

N. C. DEPARTMENT OF HUMAN RESOURCES
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SOLID WASTE & VECTOR CONTROL BRANCH

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- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500
Discharge water is treated in a licensed wastewater facility.

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste Miscellaneous solids from Lithium Metal Production area
- Item 2 - Origin of Waste Lithium Metal Cells
- Item 3 - Quantity of Waste Generated Annually 7 Tons/year
- Item 4 - Waste Composition Miscellaneous solids, Lithium Hydroxide from burned
lithium metal also lithium chloride and potassium chloride from
melt in lithium cells.
- Item 5 - Product Produced Lithium Metal
- Item 6 - Quantity per Year Confidential

NOT
LANDFILLED
NOW

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage 55 gallon drums
- Item 2 - Quantity Stored _____
- Item 3 - Frequency of Transfer to Storage Area Weekly
- Item 4 - Method of Transfer to Storage Area Truck

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Truck
- Item 2 - Source of Waste Lithium metal production area
- Item 3 - Quantity _____
- Item 4 - Destination Landfill

PART E - TREATMENT METHODOLOGY

- Item 1 - Composition of Waste Treated See Part B-Item 4

- Item 2 - Quantity _____
- Item 3 - Treatment Methods _____

- Item 4 - Equipment Used to Treat Waste _____

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste Floor sweepings
- Item 2 - Composition of Waste See Part B-Item 4

- Item 3 - Quantity _____
- Item 4 - Type of Disposal burial in landfill-cover

(9/30/77)

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type _____

(b) Liner Thickness _____ (c) Leachate Collection

_____ (d) Distance from Waste to Ground Water

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial _____

(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples

F-2: Incineration

Item 1 - Type of Waste _____

Item 2 - Quantity _____

Item 3 - Composition _____

Item 4 - Type of Incinerator _____

Item 5 - Rated Capacity _____

Item 6 - Auxillary Fuel Used _____ Amount _____

Item 7 - Design Specifications: (a) Temperature _____

(b) Dwell-Time _____ (c) Air Pollution Controls

Item 8 - Air Pollution Permit _____

Item 9 - Residue Disposal _____

Item 10 - Waste Storage Prior to Incineration _____

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SOLID WASTE & VECTOR CONTROL BRANCH

DATA COLLECTION SURVEY FORM FOR HAZARDOUS OR DIFFICULT TO HANDLE WASTE

PART A - GENERAL INFORMATION

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- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500
Discharge water is treated in a licensed wastewater facility

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste Waste from lithium bromide production
- Item 2 - Origin of Waste Hydrogen bromide surge tank, floor sweepings, lithium bromide filter muds.
- Item 3 - Quantity of Waste Generated Annually 2T/mo (24 T/yr)
- Item 4 - Waste Composition Sulfur, lithium carbonate pellets, limestone, barium sulfate and calcium sulfate
- Item 5 - Product Produced Lithium Bromide
- Item 6 - Quantity per Year Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage 55 gallon drums
- Item 2 - Quantity Stored _____
- Item 3 - Frequency of Transfer to Storage Area Weekly
- Item 4 - Method of Transfer to Storage Area Truck

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation _____
- Item 2 - Source of Waste _____
- Item 3 - Quantity _____
- Item 4 - Destination Landfill - covered

PART E - TREATMENT METHODOLOGY

- Item 1 - Composition of Waste Treated _____

- Item 2 - Quantity _____
- Item 3 - Treatment Methods _____

- Item 4 - Equipment Used to Treat Waste _____

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste solid wastes from LiBr production
- Item 2 - Composition of Waste See Part B-Item 4
- Item 3 - Quantity 2 T/mo 24 T/yr
- Item 4 - Type of Disposal Landfill - covered

F-1: Land Disposal (Continued) Does Not Apply

Item 5 - Design Specifications: (a) Liner Type _____
(b) Liner Thickness _____ (c) Leachate Collection _____
_____ (d) Distance from Waste to Ground Water _____

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial _____
(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples
Samples analyzed daily (NPDES Permit)

F-2: Incineration Does Not Apply

Item 1 - Type of Waste _____
Item 2 - Quantity _____
Item 3 - Composition _____

Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used _____ Amount _____
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controls _____

Item 8 - Air Pollution Permit _____
Item 9 - Residue Disposal _____
Item 10 - Waste Storage Prior to Incineration _____

N. C. DEPARTMENT OF HUMAN RESOURCES
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- Item 6 - Facility Contact Gerald R. Scott Telephone No. 629-2282
- Item 7 - Time Period for Which Data is Representative 1975-1977
- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500
Discharge water is treated in a licensed wastewater facility.

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste Lithium Chloride Production - Filter Muds
- Item 2 - Origin of Waste LiCl filter muds.
- Item 3 - Quantity of Waste Generated Annually 15 T/yr
- Item 4 - Waste Composition sodium chloride, calcium sulfate, and barium sulfate
- Item 5 - Product Produced Lithium Chloride
- Item 6 - Quantity per Year Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage 55 gallon drums
- Item 2 - Quantity Stored
- Item 3 - Frequency of Transfer to Storage Area Weekly
- Item 4 - Method of Transfer to Storage Area 55 gallon drums - Trucks

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Truck
- Item 2 - Source of Waste LiCl production
- Item 3 - Quantity 15 T/yr
- Item 4 - Destination Landfill

PART E - TREATMENT METHODOLOGY

- Item 1 - Composition of Waste Treated See Part B-4
- Item 2 - Quantity
- Item 3 - Treatment Methods
- Item 4 - Equipment Used to Treat Waste

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste LiCl Production Filter Muds
- Item 2 - Composition of Waste See Part B-4
- Item 3 - Quantity 15 T/yr
- Item 4 - Type of Disposal Burial - Landfill

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type _____
(b) Liner Thickness _____ (c) Leachate Collection _____
_____ (d) Distance from Waste to Ground Water _____

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial Cover with Spodumene Filter Cake
(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples
Samples of all waters from the site are sampled and analyzed
daily (NPDES permit)

F-2: Incineration Does Not Apply

Item 1 - Type of Waste _____
Item 2 - Quantity _____
Item 3 - Composition _____

Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used _____ Amount _____
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controls _____

Item 8 - Air Pollution Permit _____
Item 9 - Residue Disposal _____
Item 10 - Waste Storage Prior to Incineration _____



LITHCO

A subsidiary of FMC Corporation

Lithium Corporation of America
449 North Cox Road
Gastonia North Carolina 28054

April 27, 1987

Mr. Gordon Layton
N. C. Department of Human Resources
Solid and Hazardous Waste Management Branch
Division of Health Services
P. O. Box 2091
Raleigh, N. C. 27602-2091

Dear Mr. Layton:

Please refer to our Sanitary Landfill Permit No. 36-05 which was issued to the Lithium Corporation of America Chemical Plant in 1978. We now wish to update this permit by adding several additional solid wastes.

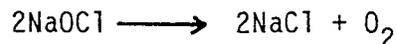
Additions to Waste Questionnaire Forms Submitted December 1, 1977:(a) Lithium Chloride Production - Filter Muds

Please add Calcium Oxalate to the list of constituents.

Oxalic acid is added to the process in order to precipitate calcium as the very insoluble calcium oxalate. The quantities are very small.

(b) Wastes from Chlorine Recovery Unit

Please add: Filter cloth with 85% polypropylene, 3% NaCl and 1% NaOCl. The NaOCl decomposes rapidly by the following reaction:



I am attaching copies of these two 1977 submittals with corrections panned-in for emphasis.

New Solid Wastes for Landfilling

Please find waste characterization sheets for the following new wastes which we are asking that you add to our landfill permit:

1. Ash from New Coal Fired Boiler

Analytical results (TCLP) are attached.

2. Decrepiation Kiln Scrubber Solids

(EP Tox Data Attached)

Mr. Gordon Layton
April 27, 1987
Page 2

3. Filter Cloths from Lithium Hypochlorite Production
4. Filter Tubes from Butyllithium Production
5. Filter Cartridges from Lithium Dissopropyl Amide Production
6. Filter Cartridges from Lithium Aluminum Chloride/Thronyl Chloride
7. Filter Cartridges from Dibutyl Magnesium Production
8. Filter Cartridges from Phenyllithium Production
9. Plastic Bags Used to Contain Magnesium Powder (emptied)
10. Mlineral Oil Recovery system Column Packing Solids
11. Filter Tubes from Lithium Hexamethyl Disilazide Production

The filter tubes or cartridges used to filter organolithium and organomagnesium compounds in hydrocarbon solvents are exposed to the atmosphere to evaporate traces of solvent remaining and to destroy any remaining reactivity. These filter tubes are to be disposed in the sanitary landfill portion of our overall landfill.

Please contact me if you have questions.

Sincerely yours,

LITHIUM CORPORATION OF AMERICA

Arthur S. Gillespie, Jr.

Arthur S. Gillespie, Jr.
Director of Corporate Services

ASGjr:mq
Enclosures

bcc: RMC, RTC, RNM, RKN, EWW

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SOLID WASTE & VECTOR CONTROL BRANCH

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- Item 5 - Facility Manager E.W. MAYLAND
R.L. Nielsen Telephone No. 629-2282
- Item 6 - Facility Contact Gerald R. Scott Telephone No. 629-2282
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Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500
Discharge water is treated in a licensed wastewater facility.

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste Lithium Chloride Production - Filter Muds
- Item 2 - Origin of Waste LiCl filter muds.
- Item 3 - Quantity of Waste Generated Annually 15 T/yr
- Item 4 - Waste Composition sodium chloride, calcium sulfate, and barium sulfate
Calcium oxalate
- Item 5 - Product Produced Lithium Chloride
- Item 6 - Quantity per Year Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage 55 gallon drums
- Item 2 - Quantity Stored
- Item 3 - Frequency of Transfer to Storage Area Weekly
- Item 4 - Method of Transfer to Storage Area 55 gallon drums - Trucks

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Truck
- Item 2 - Source of Waste LiCl production
- Item 3 - Quantity 15 T/yr
- Item 4 - Destination Landfill

PART E - TREATMENT METHODOLOGY

- Item 1 - Composition of Waste Treated See Part B-4
- Item 2 - Quantity
- Item 3 - Treatment Methods
- Item 4 - Equipment Used to Treat Waste

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste LiCl Production Filter Muds
- Item 2 - Composition of Waste See Part B-4
- Item 3 - Quantity 15 T/yr
- Item 4 - Type of Disposal Burial - Landfill

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type _____
(b) Liner Thickness _____ (c) Leachate Collection _____
_____ (d) Distance from Waste to Ground Water _____

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial Cover with Spodumene Filter Cake
(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples
Samples of all waters from the site are sampled and analyzed
daily (NPDES permit)

F-2: Incineration Does Not Apply

Item 1 - Type of Waste _____
Item 2 - Quantity _____
Item 3 - Composition _____

Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used _____ Amount _____
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controls _____

Item 8 - Air Pollution Permit _____
Item 9 - Residue Disposal _____
Item 10 - Waste Storage Prior to Incineration _____

N. C. DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
SOLID WASTE & VECTOR CONTROL BRANCH

DATA COLLECTION SURVEY FORM FOR HAZARDOUS OR DIFFICULT TO HANDLE WASTE

PART A - GENERAL INFORMATION

- Item 1 - Facility Name Lithium Corporation Of America
- Item 2 - Facility location Hwy. 161 Bessemer City, N.C. 28016
- Item 3 - Facility Owner LCA - Subsidiary Gulf Resources & Chemical Corporation
- Item 4 - Facility Mailing Address Box 795
Bessemer City, N.C.
- Item 5 - Facility Manager ~~R.L. Nielson~~ E.W. WAYLAND Telephone No. 629-2282
- Item 6 - Facility Contact Gerald R. Scott Telephone No. 629-2282
- Item 7 - Time Period for Which Data is Representative 1975-1977
- Item 8 - SIC Group Name & Four Digit Number Chemical Mfg. 2819
Primary _____ Secondary _____
- Item 9 - Number of Employees 400
- Item 10 - Average Daily Water Flow in Thousand of Gallons per Day 500
Discharge water is treated in a licensed wastewater facility.

PART B - WASTE CHARACTERIZATION

- Item 1 - Type of Waste solids - muds
- Item 2 - Origin of Waste wastes from chlorine recovery unit
- Item 3 - Quantity of Waste Generated Annually 18 Tons/year
- Item 4 - Waste Composition 5% CaSO₄, 80% Li₂CO₃, 5% K₂SO₄ and 10% Na₂SO₄
(all are approximated)

FOR LOCAL
MANUFACTURER
ONLY - NOT
USED MUCH
NOW

Filter Cloth: 85% Polyacrylene, 3% NaCl, 1% NaOCl.

- Item 5 - Product Produced Lithium Hypochlorite AND/OR SODIUM HYPOCHLORITE
- Item 6 - Quantity per Year Confidential

PART C - STORAGE METHODOLOGY

- Item 1 - Type of Storage 55 gallon drums
- Item 2 - Quantity Stored _____
- Item 3 - Frequency of Transfer to Storage Area Weekly
- Item 4 - Method of Transfer to Storage Area Truck

PART D - TRANSPORTATION METHODOLOGY

- Item 1 - Method Used in Transportation Truck
- Item 2 - Source of Waste See Part B-Item 2
- Item 3 - Quantity —
- Item 4 - Destination Landfill, cover with ore tailings

PART E - TREATMENT METHODOLOGY DNA

- Item 1 - Composition of Waste Treated _____

- Item 2 - Quantity _____
- Item 3 - Treatment Methods _____

- Item 4 - Equipment Used to Treat Waste _____

PART F - DISPOSAL METHODOLOGY

F-1: Land Disposal

- Item 1 - Type of Waste Solids
- Item 2 - Composition of Waste See Part B-Item 4
- Item 3 - Quantity See Part B-Item 3
- Item 4 - Type of Disposal Burial - Landfill - cover

F-1: Land Disposal (Continued)

Item 5 - Design Specifications: (a) Liner Type _____
(b) Liner Thickness _____ (c) Leachate Collection
_____ (d) Distance from Waste to Ground Water

Item 6 - Operating Procedures:

(a) Land Site Security _____

(b) Method of Burial _____
(c) Leachate Treatment Procedures _____

(d) Type of Analysis Performed on Leachate and Ground Water Samples

F-2: Incineration DNA

Item 1 - Type of Waste _____
Item 2 - Quantity _____
Item 3 - Composition _____

Item 4 - Type of Incinerator _____
Item 5 - Rated Capacity _____
Item 6 - Auxillary Fuel Used _____ Amount: _____
Item 7 - Design Specifications: (a) Temperature _____
(b) Dwell-Time _____ (c) Air Pollution Controls

Item 8 - Air Pollution Permit _____
Item 9 - Residue Disposal _____
Item 10 - Waste Storage Prior to Incineration _____

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Ash from Coal Fired Boiler
3. What volume of disposal will there be? 40,000 ft³(5,000 tons)(annually)
4. What frequency of disposal will there be? 3,333 ft³ (417 tons) (monthly)
5. Explain either the manufacturing process or how the waste was generated.
This ash is from our new coal fired boiler.

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
2. What other constituents are present and in what concentration? (Attach
lab results.) Ash
- * 3. What is the moisture content? 10%
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Truck

"I hereby certify that the information submitted in regard to
Boiler Ash (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie, Jr.
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

SAMPLE SOURCES

BILL TO: Lithium Corporation of America
P. O. Box 795, Hwy 161
Bessemer City, N. C. 28016
ATTN: Mr. William S. Kane
G.R. SCOTT

P.O. # _____ SAMPLE TYPE _____ GRAB _____ COMPOSITE _____

WASTEWATER _____ DATE SAMPLED 10-05-86

SLUDGE _____ COLLECTED BY Joe Ratchford/cks

OIL _____ REMARKS Ash from

LEACHATE _____ Co-Gen System

OTHER X Do not pay for this copy

No. 161

PARAMETER	RESULTS	DATE ANALYZED	ANALYST	METHOD OF ANALYSIS	CHARGE
-----------	---------	---------------	---------	--------------------	--------

TCLP - Metals

Arsenic, As	<0.05	10/14	DF	206.2	
Barium, Ba	<0.5	10/14	JK	208.2	
Cadmium, Cd	<0.01	10/13	DF	213.1	
Chromium, Cr	<0.05	10/13	DF	218.1	
Lead, Pb	<0.05	10/13	DF	239.1	
Mercury, Hg	<0.002	10/16	DF	245.1	
Selenium Se	<0.01	10/14	DF	270.2	
Silver, Ag	<0.01	10/13	DF	272.1	

Regulatory Level (5 mg/l)

All results reported in mg/l unless otherwise noted.

Judy Kidd

DATA REVIEWED BY:

STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Decrepitation Kiln Scrubber Solids
3. What volume of disposal will there be? 10,000 ft³(500 tons)
4. What frequency of disposal will there be? Annually
5. Explain either the manufacturing process or how the waste was generated. The solids are collected from the exhaust of the decrepitation kiln by a wet scrubbing system.

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

- 1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
- 2. Does the waste exhibit any of the four characteristics as defined by .0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No (Lab Results Attached)

INFORMATION FOR LANDFILLING DETERMINATION

- 1. Does the waste contain any hazardous waste constituents listed in .0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach lab results.)

- 2. What other constituents are present and in what concentration? (Attach lab results.) 83% Spodumene Ore, 1% Aluminum Fluoride, and less than 0.5% Hydrofluoric Acid. Acidity is quickly neutralized by excess CaCO₃ in the landfill.
- * 3. What is the moisture content? 15%
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e., barrels, bags, etc.)? Truck

"I hereby certify that the information submitted in regard to Decrepitation Scrubber Solids (name of waste) is true and correct to the best of my knowledge and belief."

Arthur S. Gillespie
(signature)

All questions concerning this "Procedure" should be directed to Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

EMS Laboratories, Inc.

4132 POMPADRO DRIVE
 CHARLOTTE, NORTH CAROLINA 28216
 (704) 392-6276

REPORT NUMBER

SAMPLE SOURCES

Fines *KIM Scribner*

BILL TO:

Lithium Corporation of America
 P.O. Box 795
 Bessemer City, N.C. 28016
 Att: Mr. Gerald R. Scott

REPORT DATE 6/17/86 DATE RECEIVED _____
 EMS SAMPLE # 1012-2 SAMPLE TYPE GRAB COMPOSITE
 P.O. # 85378 DATE SAMPLED 4-28-86
 WASTEWATER _____ COLLECTED BY 4-28-86 GRS
 SLUDGE _____
 OIL _____ REMARKS _____
 LEACHATE _____
 OTHER _____

No. 00885

Do not pay from this copy

PARAMETER RESULTS DATE ANALYZED ANALYST METHOD OF ANALYSIS CHARGE

EP TOXICITY - Leachate

Arsenic, As	0.09	6/11/86	DF	206.2	
Barium, Ba	<0.5	6/12/86	DF	208.2	
Cadmium, Cd	<0.01	6/4/86	DF	213.1	
Chromium, Cr	<0.05	6/3/86	DF	218.1	
Lead, Pb	<0.05	6/4/86	DF	239.1	
Mercury, Hg	<0.001	6/13/86	DF	245.1	
Selenium, Se	<0.01	6/11/86	DF	270.2	
Silver, Ag	<0.01	6/3/86	DF	272.1	

All results in mg/L total \$249.00

DATA REVIEW

Judy Skid

REPORT COPY

STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Lithium Hypochlorite Filter Cloths
3. What volume of disposal will there be? 6.7 ft³(200 lbs)(Annually)
4. What frequency of disposal will there be? 0.6 ft³(16.7 lbs)(Monthly)
5. Explain either the manufacturing process or how the waste was generated. Waste is Generated when Lithium Hypochlorite Solution or Sodium Hypochlorite Solutions are Filtered

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
2. What other constituents are present and in what concentration? (Attach
lab results.) 85% Polypropylen Filter Cloth; 3% Lithium Carbonate;
1% Sodium Chloride; H₂O 10%
- * 3. What is the moisture content? 10%
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Waste Hopper

"I hereby certify that the information submitted in regard to Lithium Hypochlorite Filter Cloths (name of waste) is true and correct to the best of my knowledge and belief."

Arthur S. Gillespie
(signature)

All questions concerning this "Procedure" should be directed to Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

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The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Filter Tubes from Butyllithium Production
3. What volume of disposal will there be? 10 ft³(200 lbs)annually
4. What frequency of disposal will there be? 0.83 ft³(17 lbs)monthly
5. Explain either the manufacturing process or how the waste was generated. Filtering of a Hydrocarbon Solution of Butyllithium
The filters are exposed to the air to evaporate traces of
hydrocarbons and to react any remaining traces of butyllithium.

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

- 1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
- 2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

- 1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
- 2. What other constituents are present and in what concentration? (Attach
lab results.) 90.0% Polypropylene Filter Tube; 8.0% Hexane;
2.0% Lithium Hydroxide The filter tubes are exposed to the air to
evaporate hexane and to react any butyllithium. One (1) gram of filter in
- * 3. What is the moisture content? 0 450 ml of water has a pH of 9.9.
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Drums

"I hereby certify that the information submitted in regard to Butyllithium
Filter Tubes (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gilleyer, Jr.
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA
DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

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The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Filter Cartridges from Lithium Diisopropyl Amide Production
3. What volume of disposal will there be? 0.25 ft³(10 lb)(annually)
4. What frequency of disposal will there be? 0.02 ft³(1 lb)monthly
5. Explain either the manufacturing process or how the waste was generated. Filtering of Lithium Diisopropyl Amide Solution

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
2. What other constituents are present and in what concentration? (Attach
lab results.) 99.6% Fiberglass Filter Tube; 0.3% Diisopropyl Amide;
0.1% LiOH
- * 3. What is the moisture content? 0
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Drums

"I hereby certify that the information submitted in regard to Lithium
Diisopropyl Amide Filters (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

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The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, NC 28016
2. What is the waste? Filter Cartridges from $\text{LiAlCl}_4/\text{SOCl}_2$ Production
3. What volume of disposal will there be? $0.25 \text{ ft}^3(10 \text{ lbs})(\text{annually})$
4. What frequency of disposal will there be? $0.02 \text{ ft}^3(1 \text{ lb})\text{monthly}$
5. Explain either the manufacturing process or how the waste was generated.
Filtering of LiAlCl_4 in SOCl_2

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

- 1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
- 2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

- 1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
- 2. What other constituents are present and in what concentration? (Attach
lab results.) 67.0% Fiberglass Filter Tube; 25.0% Aluminum Chloride;
8.0% Lithium Chloride. Filter tubes are water washed to react AlCl₃.
Any acidity is quickly neutralized by excess CaCO₃ in the landfill.
- * 3. What is the moisture content? 0
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Drums

"I hereby certify that the information submitted in regard to LiAlCl₄/SOCl₂
Filter Cartridges (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie Jr.
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Filter Cartridges from Dibutylmagnesium Production
3. What volume of disposal will there be? 2 ft³(80 lbs)annually
4. What frequency of disposal will there be? 0.17 ft³(6.7 lbs)monthly
5. Explain either the manufacturing process or how the waste was generated. Filter Cartridges from Dibutylmagnesium Production

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
2. What other constituents are present and in what concentration? (Attach
lab results.) 99.4% Fiberglass Filter Tube; 0.1% Magnesium Hydroxide;
0.5% Heptane
- * 3. What is the moisture content? 0
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Drums

"I hereby certify that the information submitted in regard to Filter Cartridge
from Dibutylmagnesium Production (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Filter Cartridges from Phenyllithium Production
3. What volume of disposal will there be? 0.25 ft³(10 lbs)
4. What frequency of disposal will there be? Quarterly
5. Explain either the manufacturing process or how the waste was generated. Fiberglass Filter Tube Used to Filter Phenyllithium Products

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
2. What other constituents are present and in what concentration? (Attach
lab results.) 99.9% Fiberglass with 0.1% LiOH
- * 3. What is the moisture content? 0
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Drums

"I hereby certify that the information submitted in regard to Filter
Cartridges from Phenyllithium Production (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie, Jr.
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Plastic Bags from Magnesium Powder
3. What volume of disposal will there be? 1.7 ft³(50 lbs) Annually
4. What frequency of disposal will there be? Quarterly
5. Explain either the manufacturing process or how the waste was generated. Waste is generated when bags are emptied.

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

- 1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
- 2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
(EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

- 1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
- 2. What other constituents are present and in what concentration? (Attach
lab results.) 99% Plastic Bags and 1% Magnesium Powder
- * 3. What is the moisture content? 0%
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Waste Hopper

"I hereby certify that the information submitted in regard to Plastic
Bags from Magnesium Powder (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie Jr.
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works sludges.

The Division of Health Services reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the waste environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid and in a form that can be confined, compacted, and covered in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Mineral Oil Recovery System Column Packing Solids
3. What volume of disposal will there be? 800 ft³(20 tons)(annually)
4. What frequency of disposal will there be? Quarterly
5. Explain either the manufacturing process or how the waste was generated. The packing waste is generated when mineral oil is recovered using clay. The column is washed with hexane to remove mineral oil, and then the hexane is vacuum pumped from the column and recovered. The clay packing being landfilled will have only traces of organic material (lithium oleate).

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

- 1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
- 2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

- 1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
- 2. What other constituents are present and in what concentration? (Attach
lab results.) 83% Clay; 4% Lithium Oleate; and Lithium Hydroxide 3%
The pH of a 1 gram sample when placed in a liter of water was 10.2.
- * 3. What is the moisture content? 10%
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Truck

"I hereby certify that the information submitted in regard to Mineral Oil
Recovery Column Packing (name of waste) is true and correct to
the best of my knowledge and belief."

Arthur S. Gillespie, Jr.
(signature)

All questions concerning this "Procedure" should be directed to
Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific
questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

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The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste
Lithium Corporation of America Chemical Manufacturing Plant
Highway 161, Bessemer City, N. C. 28016
2. What is the waste? Filter Tubes from Lithium Hexamethyl Disilazide
Production
3. What volume of disposal will there be? 0.25 ft³(10 lbs) annually
4. What frequency of disposal will there be? Semiannually
5. Explain either the manufacturing process or how the waste was generated. Filtering of Hydrocarbon Solutions of Lithium
Hexamethyl Disilazide

(more)

INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (10 NCAC 10F .0029)

- 1. Is the waste listed under .0029(e) (i.e., 40 CFR 261.31 - 261.33)?
If yes, list number. No
- 2. Does the waste exhibit any of the four characteristics as defined by
.0029(d) (i.e., 40 CFR 261.21 - 261.24)? (Attach lab results)
* (EP Toxicity for metals and pH). No

INFORMATION FOR LANDFILLING DETERMINATION

- 1. Does the waste contain any hazardous waste constituents listed in
.0029(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes,
what constituents and what concentration? (Attach lab results.)
No
- 2. What other constituents are present and in what concentration? (Attach
lab results.) Fiberglass Filter Tubes 99.6%
Lithium Hydroxide 0.4%
The filter tubes are air dried to evaporate hydrocarbon solvents.
- * 3. What is the moisture content? 0
- * 4. Which solid waste management facility is the request for?
36-05
- * 5. Specify how the waste will be delivered - in bulk or containers (i.e.,
barrels, bags, etc.)? Drums

"I hereby certify that the information submitted in regard to Filters for Li Hexamethyl Disilazide Production (name of waste) is true and correct to the best of my knowledge and belief."

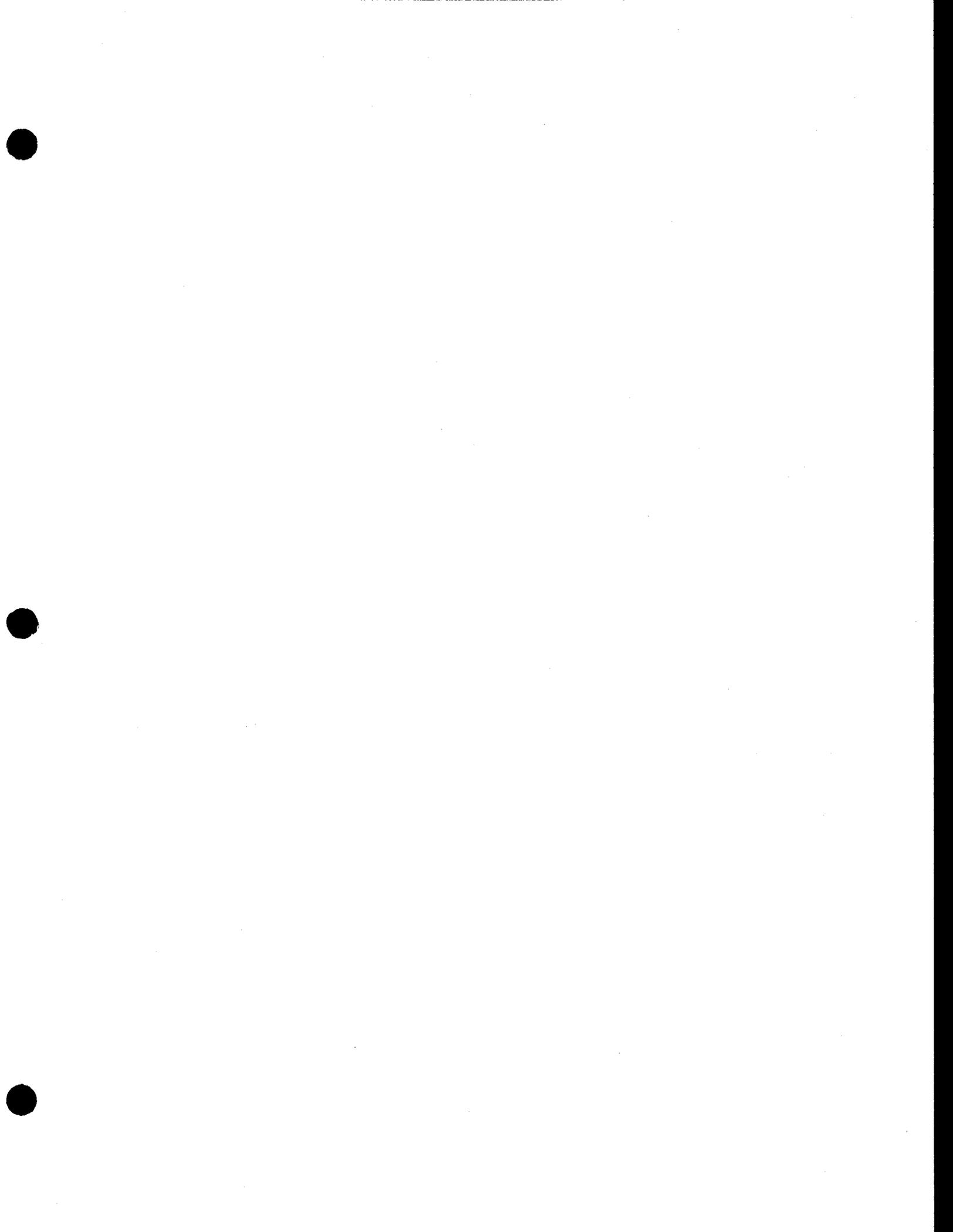
Arthur S. Gillespie
(signature)

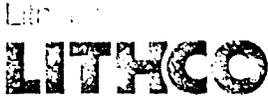
All questions concerning this "Procedure" should be directed to Gordon Layton or Jerry Rhodes at (919) 733-2178. Answer specific questions in space provided. Attach additional sheets if necessary.

Complete all information, sign and submit to:

Division of Health Services
Solid & Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Attn: Waste Determination





A subsidiary of LITHCO, Inc.

1000 North ...
Raleigh, NC 27602

November 20, 1989

Division of Health Services
Solid and Hazardous Waste Management Branch
P. O. Box 2091
Raleigh, NC 27602

Dear Sir or Madam:

We are submitting herewith an application of approval to dispose of some ion exchange resins in our company sanitary landfill. This material is not a hazardous waste. Our landfill permit is No. 36-05.

Sincerely yours,

Arthur S. Gillespie, Jr.
Arthur S. Gillespie, Jr.
Environmental Manager

cc: J. L. Larson
M. W. Stark
G. R. Scott
R. N. Mesiah

STATE OF NORTH CAROLINA

DEPARTMENT OF HUMAN RESOURCES
Division of Health Services
ENVIRONMENTAL HEALTH SECTION
Solid & Hazardous Waste Management Branch

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

This procedure will be used by the Division of Health Services to determine whether a waste is (1) hazardous as defined by 10 NCAC 10F, and (2) suitable for disposal at a solid waste management facility.

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The following information is required for an evaluation. An asterisk (*) denotes information required for Publicly Owned Treatment Works.

* GENERAL INFORMATION

1. Name and address of facility or person generating waste Lithium Corporation of America, Hwy 161, P. O. Box 795
Bessemer City, NC 28016
2. What is the waste? Amberlite Ion Exchange Resins
3. What volume of disposal will there be? Approximately 140 Cubit Feet/Year
4. What frequency of disposal will there be? Once/Year
5. Explain either the manufacturing process or how the waste was generated. Ion Exchange Resins Used to Demineralize Water Fed to Steam Boiler.

(more)

C E R T I F I C A T E O F A N A L Y S I S

CORRESPOND TO -----

SAMPLE -----

EMS Laboratories, Inc
4132 Pompano Street
Charlotte, N. Carolina 28216
(704) 393-1853

N.C. Waste Lab Cert. No. 98
N.C. Water Lab Cert. No. 37727
S.C. Lab Cert. No. 99011
U.S. EPA id 00118

EMS SAMPLE : B16644
REPORT DATE : 08/17/89
DATE RECEIVED : 08/02/89
DATE COMPLETE : 08/16/89

REPORT TO -----

BILL TO -----

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

D E S C R I P T I O N

RESIN ANIONIC

DATE : 07/31/89
TIME :

P.O. NUMBER : 25441 CHEM-PLT

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
ARSENIC, EXTRACT		SW846-7060	08/10/89	MK
ARSENIC, EXTRACT	: BDL		0.005	MG/L
INSTRUMENT	: PE Z3030			
BARIUM, EXTRACT		SW846-7080	08/16/89	BW
BARIUM, EXTRACT	: BDL		0.5	MG/L
INSTRUMENT	: PE 3030			
CADMIUM, EXTRACT		SW846-7130	08/15/89	MK
CADMIUM, EXTRACT	: BDL		0.01	MG/L
INSTRUMENT	: PE 3030			
CHROMIUM, EXTRACT		SW846-7190	08/11/89	MK
CHROMIUM, EXTRACT	: BDL		0.03	MG/L
INSTRUMENT	: PE 3030			
LEAD, EXTRACT		SW846-7420	08/14/89	MK
LEAD, EXTRACT	: BDL		0.2	MG/L
INSTRUMENT	: PE 3030			
MERCURY, EXTRACT		SW846-7470	08/09/89	BW
MERCURY, EXTRACT	: BDL		0.0005	MG/L
INSTRUMENT	: PE 360			
SELENIUM, EXTRACT		SW846-7740	08/10/89	MK
SELENIUM, EXTRACT	: BDL		0.005	MG/L
INSTRUMENT	: PE Z3030			

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
SILVER, EXTRACT		SW846-7760	08/15/89	MK
SILVER, EXTRACT	: BDL		0.05	MG/L
INSTRUMENT.....	: PE 3030			
EP TOXICITY EXTRACTION, WITHOUT ORGANICS		SW846-1310	08/02/89	BW
EP TOX EXT, W/O	: COMPLETE		NA	NA
TOT SAMPLE WEIGHT, G.....	: 80.75			
SOLID PORTION, G	: 80.75			
LIQUID PORTION, ML	: NA			
9.5 mm SIEVE TEST	: PASSED			
INITIAL DI ADDED, ML.....	: 1292			
FINAL DI ADDED, ML	: 319			
INITIAL PH	: 8.3			
FINAL PH	: 9.1			
PH ADJUSTMENTS	: ATTACHED			
TOTAL ACID ADDED, ML.....	: 4.0			
VOL EXTRACT FILT, ML.....	: 1615			
TOT VOL FILTRATES,ML.....	: 1615			
ACID DIGESTION OF LEACHATE FOR FAA OR ICP		SW846-3010	08/04/89	BW
METALS DIGESTION	: COMPLETE		NA	NA
INITIAL VOL, ML	: 50			
FINAL VOL, ML	: 50			
ACID DIGESTION OF LEACHATE FOR GFAA		SW846-3020	08/04/89	BW
METALS DIGESTION	: COMPLETE		NA	
INITIAL VOL, ML	: 50			
FINAL VOL, ML	: 50			

ND - Not Detected
 NA - Not Applicable
 BDL - Below Detection Limit
 Sample was accompanied by chain of custody papers

Approved by : Helmut M.B. Jansen

CERTIFICATE OF ANALYSIS

CORRESPOND TO _____

SAMPLE _____

EMS Laboratories, Inc
4132 Pompano Street
Charlotte, N. Carolina 28216
(704) 393-1853

N.C. Waste Lab Cert. No. 98
N.C. Water Lab Cert. No. 37727
S.C. Lab Cert. No. 99011
U.S. EPA id 00118

EMS SAMPLE : B17596
REPORT DATE : 09/28/89
DATE RECEIVED : 09/25/89
DATE COMPLETE : 09/27/89

REPORT TO _____

BILL TO _____

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

DESCRIPTION

ANIONIC RESIN
ADDITIONAL ANALYSIS ON SAMPLE B16644
P.O. NUMBER : 25441 CHEM-PLT

DATE :
TIME :

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
PAINT FILTER LIQUIDS TEST		SW846-9095	09/26/89	SRG
PAINT FILTER LIQUID.....	: POSITIVE		NA	NA

ND - Not Detected
NA - Not Applicable
BDL - Below Detection Limit
Sample was accompanied by chain of custody papers

*Contains some free liquids
0.5% (Est)*

pH = 8.3

Approved by : Chelmuith MB Janssen

C E R T I F I C A T E O F A N A L Y S I S

CORRESPOND TO -----

SAMPLE -----

EMS Laboratories, Inc
4132 Pompano Street
Charlotte, N. Carolina 28216
(704) 393-1853

N.C. Waste Lab Cert. No. 98
N.C. Water Lab Cert. No. 37727
S.C. Lab Cert. No. 99011
U.S. EPA id 00118

EMS SAMPLE : B16645
REPORT DATE : 08/17/89
DATE RECEIVED : 08/02/89
DATE COMPLETE : 08/16/89

REPORT TO -----

BILL TO -----

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

DESCRIPTION -----

RESIN CATIONIC

DATE : 07/31/89
TIME :

P.O. NUMBER : 25441 CHEM-PLT

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
ARSENIC, EXTRACT		SW846-7060	08/10/89	MK
ARSENIC, EXTRACT	: BDL		0.005	MG/L
INSTRUMENT	: PE Z3030			
BARIUM, EXTRACT		SW846-7080	08/16/89	BW
BARIUM, EXTRACT	: 0.8		0.5	MG/L
INSTRUMENT.....	: PE 3030			
CADMIUM, EXTRACT		SW846-7130	08/15/89	MK
CADMIUM, EXTRACT	: BDL		0.01	MG/L
INSTRUMENT.....	: PE 3030			
CHROMIUM, EXTRACT		SW846-7190	08/11/89	MK
CHROMIUM, EXTRACT	: 0.19		0.03	MG/L
INSTRUMENT.....	: PE 3030			
LEAD, EXTRACT		SW846-7420	08/14/89	MK
LEAD, EXTRACT	: BDL		0.2	MG/L
INSTRUMENT.....	: PE 3030			
MERCURY, EXTRACT		SW846-7470	08/09/89	BW
MERCURY, EXTRACT	: BDL		0.0005	MG/L
INSTRUMENT.....	: PE 360			
SELENIUM, EXTRACT		SW846-7740	08/10/89	MK
SELENIUM, EXTRACT	: BDL		0.005	MG/L
INSTRUMENT.....	: PE Z3030			

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
SILVER, EXTRACT		SW846-7760	08/15/89	MK
SILVER, EXTRACT	: BDL		0.05	MG/L
INSTRUMENT.....	: PE 3030			
EP TOXICITY EXTRACTION, WITHOUT ORGANICS		SW846-1310	08/02/89	BW
EP TOX EXT, W/O	: COMPLETE		NA	NA
TOT SAMPLE WEIGHT, G.....	: 80.04			
SOLID PORTION, G	: 80.04			
LIQUID PORTION, ML	: NA			
9.5 mm SIEVE TEST	: PASSED			
INITIAL DI ADDED, ML.....	: 1281			
FINAL DI ADDED, ML	: 320			
INITIAL PH	: 4.5			
FINAL PH	: 3.5			
PH ADJUSTMENTS	: NO			
TOTAL ACID ADDED, ML.....	: 0.0			
VOL EXTRACT FILT, ML.....	: 1601			
TOT VOL FILTRATES, ML.....	: 1601			
ACID DIGESTION OF LEACHATE FOR FAA OR ICP		SW846-3010	08/04/89	BW
METALS DIGESTION	: COMPLETE		NA	NA
INITIAL VOL, ML	: 50			
FINAL VOL, ML	: 50			
ACID DIGESTION OF LEACHATE FOR GFAA		SW846-3020	08/04/89	BW
METALS DIGESTION	: COMPLETE		NA	
INITIAL VOL, ML	: 50			
FINAL VOL, ML	: 50			

ND - Not Detected

NA - Not Applicable

BDL - Below Detection Limit

Sample was accompanied by chain of custody papers

Approved by : Chelmuith MB Jansen

CORRESPOND TO

SAMPLE

EMS Laboratories, Inc
4132 Pompano Street
Charlotte, N. Carolina 28216
(704) 393-1853

N.C. Waste Lab Cert. No. 98
N.C. Water Lab Cert. No. 37727
S.C. Lab Cert. No. 99011
U.S. EPA id 00118

EMS SAMPLE : B17597
REPORT DATE : 09/28/89
DATE RECEIVED : 09/25/89
DATE COMPLETE : 09/27/89

REPORT TO

BILL TO

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

GERALD SCOTT
LITHIUM CORPORATION OF AMERICA
HWY 161
P O BOX 795
BESSEMER CITY NC 28016

DESCRIPTION

CATIONIC RESIN
ADDITIONAL ANALYSIS ON SAMPLE B16645
P.O. NUMBER : 25441 CHEM-PLT

DATE :
TIME :

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
-----------------------------	--------	--------	--------------------	------------------

PAINT FILTER LIQUIDS TEST		SW846-9095	09/26/89	SRG
PAINT FILTER LIQUID.....	: NEGATIVE		NA	NA

- Not Detected
- Not Applicable

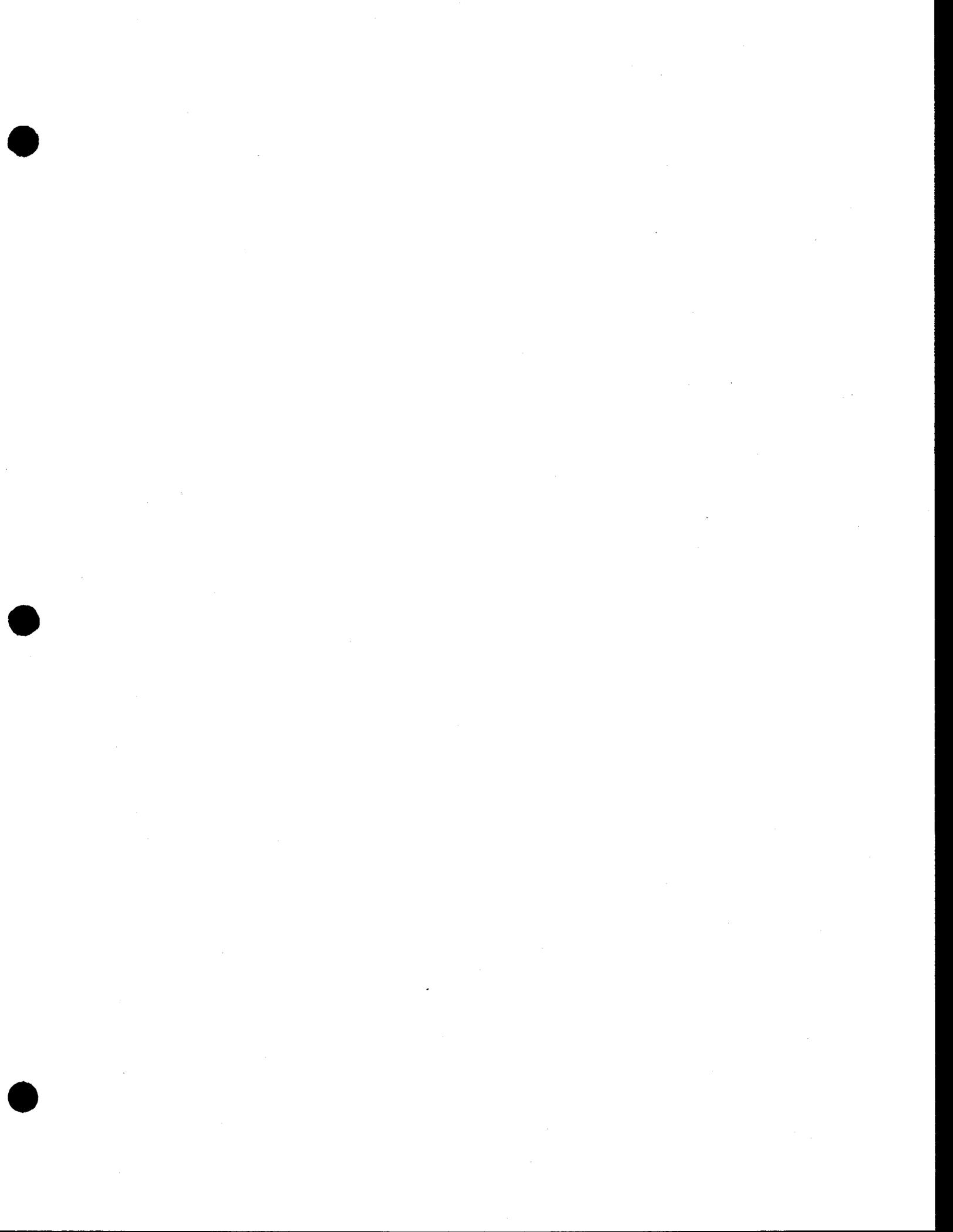
BDL - Below Detection Limit

Sample was accompanied by chain of custody papers

solid - no liquid

pH = 4.5

Approved by : *Delmuth MB Jansen*



FMC Corporation

Lithium Division
Highway 161
Box 795
Bessemer City North Carolina 28018
704 868 5300 Fax 704 868 5486

FMC

December 8, 1992

Solid Waste Management Division
Solid Waste Section
P. O. Box 27687
Raleigh, NC 27611

Attn: Solid Waste Determination

Dear Sir or Madam:

Please find enclosed requests for permission to landfill two solid wastes at our landfill 36-05. Supporting data is included.

Sincerely yours,

Arthur S. Gillespie, Jr.
Arthur S. Gillespie, Jr.
Environmental Manager

/lb

Encl.

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES
SOLID WASTE MANAGEMENT DIVISION; SOLID WASTE SECTION

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION

15A N.C. Admin. Code 13B .0103(d)

This procedure will be used by the Solid Waste Management Division to determine whether a waste is (1) hazardous as defined by 15A NCAC 13A, and (2) suitable for disposal at a solid waste management facility. The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works Sludges.

The Solid Waste Management Division reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the wastes environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid which can be properly managed in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. Incomplete waste determination forms will be returned to the generator without review. An asterisk(*) denotes information required for Publicly Owned Treatment Works.

A * GENERAL INFORMATION

1. Name, TELEPHONE NUMBER and mailing address of facility or person generating waste
FMC Corp., Lithium Div., Chemical Mfg. Plant
P. O. Box 795, Bessemer City, NC 28016
Attention: A. S. Gillespie, Jr. Tel: (704) 868-5417
2. Specific location of waste (i.e. SR. #, county, city, etc...)
Highway 161 W., Bessemer City, NC 28016
3. What is the waste? Sand from sandblasting operation
4. What volume of disposal will there be? 100 tons/yr.:: Estimate 71 Cu.Yd/year
5. What frequency of disposal will there be? 2 times/week (estimate)
6. Explain either the manufacturing process or how the waste was generated.
Spent sand used in sandblasting surfaces to be painted.

B INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (15A N.C. Admin. Code 13A .0006)

1. Is the waste listed under .0006(d) (i.e., 40 CFR 261.30 - 261.33)? If yes, list number. None
- *2. Does the waste exhibit any of the four characteristics as defined by 15A N.C. Admin. Code 13A .0006(c) (i.e., 40 CFR 261.20-261.24)? (Attach laboratory results for TC Toxicity, Reactivity, Ignitability, Corrosivity.) no: TCLP attached

C INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in 15A N.C. Admin. Code 13A .0006(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach laboratory results) No
2. What other constituents are present and in what concentration?
(Attach laboratory results) Paint flakes.
3. Will the handling and disposal of this waste create dust emissions which may cause a health hazard or nuisance to landfill personnel. No, this is a low-silica sand.
- *4. Does the waste pass the "paint filter" test for free liquids (Method 9095 in S.W. 846)? (Attach laboratory results) N/A No liquids at all.
- *5. Which solid waste management facility is the request for (name of landfill and permit number, incinerator, etc...)? FMC Corp. Permit 36-05
- *6. Specify how the waste will be delivered - in bulk or containers (i.e. barrels, bags, etc.) Fiber drums.



an environmental testing company

P.O. Box 12846

Research Triangle Park, North Carolina 27709

(919) 677-0090

FAX (919) 677-0427

November 19, 1991

Art Gillespie
FMC Lithium Corporation
NC Highway 161
Bessemer City, NC 28016

IEA Project No.: 1172022
IEA Reference No.: A9110432
Client Project I.D.: 46R51062

Dear Mr. Gillespie,

Transmitted herewith are the results of analyses on one sample submitted to our laboratory.

Please see the enclosed reports for your results.

Very truly yours,

IEA, Inc.

Linda F. Mitchell

Linda F. Mitchell
Director, Technical Support Services

State Certification:

Alabama - #40210	Tennessee - #00296	South Carolina - #99021
Georgia - #816	Virginia - #00179	North Carolina - #37720
New Jersey - #67719		#84

Monroe,
Connecticut
203-261-4458

Miramar,
Florida
305-989-0928

Schaumburg,
Illinois
708-705-0740

N. Billerica,
Massachusetts
617-272-5212

Whippany,
New Jersey
201-428-8181

Essex Junction,
Vermont
802-878-5138



IEA LABORATORY RESULTS

IEA Project #: 1172-022
Client Name: FMC Lithium Corporation

Sample #	Client ID	Parameter	Results	Date Analyzed
1	HLA	pH	8.2	11/01/91



IEA LABORATORY RESULTS
TCLP SCREEN

IEA Project #: 1172-022
Client Name: FMC Lithium Corporation

Sample #	Client ID	Parameter	Regulatory Level	Results	Date Analyzed
=====					
		TCLP METALS:			
1	HLA	Arsenic	5.0 mg/L	<0.50 mg/L	10/31/91
1	HLA	Barium	100 mg/L	<1.0 mg/L	10/31/91
1	HLA	Cadmium	1.0 mg/L	<0.10 mg/L	10/31/91
1	HLA	Chromium	5.0 mg/L	<0.50 mg/L	10/31/91
1	HLA	Mercury	0.2 mg/L	<0.0025 mg/L	11/02/91
1	HLA	Lead	5.0 mg/L	<0.50 mg/L	10/31/91
1	HLA	Selenium	1.0 mg/L	<0.10 mg/L	11/04/91
1	HLA	Silver	5.0 mg/L	<0.50 mg/L	10/31/91

Comments:

*Please note that this report does not include matrix spike and corrected results as required in the TCLP Method (40 CFR, Part 261, Subpart C, Appendix I).



IEA LABORATORY RESULTS
TCLP

IEA Project #: 1172-022
Client Name: FMC Lithium Corporation

Client ID	Parameter	Regulatory Level	Results	Date Analyzed
=====				
	TCLP METALS:			
TCLP Blank	Arsenic	5.0 mg/L	<0.50 mg/L	10/31/91
Prep Blank	Arsenic	5.0 mg/L	<0.10 mg/L	10/31/91
TCLP Blank	Barium	100 mg/L	<1.0 mg/L	10/31/91
Prep Blank	Barium	100 mg/L	<0.10 mg/L	10/31/91
TCLP Blank	Cadmium	1.0 mg/L	<0.10 mg/L	10/31/91
Prep Blank	Cadmium	1.0 mg/L	<0.01 mg/L	10/31/91
TCLP Blank	Chromium	5.0 mg/L	<0.50 mg/L	10/31/91
Prep Blank	Chromium	5.0 mg/L	<0.03 mg/L	10/31/91
TCLP Blank	Mercury	0.2 mg/L	<0.0025 mg/L	11/02/91
Prep Blank	Mercury	0.2 mg/L	<0.0005 mg/L	11/02/91
TCLP Blank	Lead	5.0 mg/L	<0.50 mg/L	10/31/91
Prep Blank	Lead	5.0 mg/L	<0.05 mg/L	10/31/91
TCLP Blank	Selenium	1.0 mg/L	<0.10 mg/L	11/04/91
Prep Blank	Selenium	1.0 mg/L	<0.10 mg/L	11/04/91
TCLP Blank	Silver	5.0 mg/L	<0.50 mg/L	10/31/91
Prep Blank	Silver	5.0 mg/L	<0.05 mg/L	10/31/91

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES
SOLID WASTE MANAGEMENT DIVISION; SOLID WASTE SECTION

PROCEDURE AND CRITERIA FOR WASTE DETERMINATION
15A N.C. Admin. Code 13B .0103(d)

This procedure will be used by the Solid Waste Management Division to determine whether a waste is (1) hazardous as defined by 15A NCAC 13A, and (2) suitable for disposal at a solid waste management facility. The types of wastes that will be evaluated by this procedure are primarily, but not exclusively, industrial and commercial wastes and sludges, and Publicly Owned Treatment Works Sludges.

The Solid Waste Management Division reserves the right to request additional information or waive some of the requirements based on the type of waste if it deems necessary. The Division may also require some wastes to be treated or altered to render the wastes environmentally immobile prior to disposal at a sanitary landfill. Wastes disposed at sanitary landfills must be non-liquid which can be properly managed in accordance with the "Solid Waste Management Rules". APPROVAL TO DISPOSE OF THE WASTE SHALL ALSO BE OBTAINED FROM THE OWNER OR OPERATOR OF THE LANDFILL PRIOR TO DISPOSAL.

The following information is required for an evaluation. Incomplete waste determination forms will be returned to the generator without review. An asterisk(*) denotes information required for Publicly Owned Treatment Works.

A * GENERAL INFORMATION

1. Name, TELEPHONE NUMBER and mailing address of facility or person generating waste
FMC Corporation Lithium Division, Chemical Manufacturing Plant
P. O. Box 795, Bessemer City, NC 28016
Attention: A. S. Gillespie, Jr. Telephone (704) 868-5417
2. Specific location of waste (i.e. SR. #, county, city, etc...)
Highway 161 W., Bessemer City, NC.
3. What is the waste? Effluent Treatment Filter Cake (solids from filtration of
neutralized and Hydrogen Peroxide treated Lithium Hypochlorite Solution)
4. What volume of disposal will there be? 3 cu. feet per week.
5. What frequency of disposal will there be? 1 time per week.
6. Explain either the manufacturing process or how the waste was generated.
Waste waters from Lithium Hypochlorite production are neutralized, treated with
Hydrogen Peroxide to destroy Chlorine and filtered through filter acid.

B INFORMATION FOR HAZARDOUS (RCRA) DETERMINATION (15A N.C. Admin. Code 13A .0006)

1. Is the waste listed under .0006(d) (i.e., 40 CFR 261.30 - 261.33)? If yes, list number. none
- *2. Does the waste exhibit any of the four characteristics as defined by 15A N.C. Admin. Code 13A .0006(c) (i.e., 40 CFR 261.20-261.24)? (Attach laboratory results for TC Toxicity, Reactivity, Ignitability, Corrosivity.) No. see TCLP results.

C INFORMATION FOR LANDFILLING DETERMINATION

1. Does the waste contain any hazardous waste constituents listed in 15A N.C. Admin. Code 13A .0006(e), Appendix VIII (i.e., 40 CFR 261, Appendix VIII)? If yes, what constituents and what concentration? (Attach laboratory results) No
2. What other constituents are present and in what concentration?
(Attach laboratory results) Traces of NaCl, KCl; Li₂SO₄ in the small amount of
water remaining in the filter cake.
3. Will the handling and disposal of this waste create dust emissions which may cause a health hazard or nuisance to landfill personnel. No
- *4. Does the waste pass the "paint filter" test for free liquids (Method 9095 in S.W. 846)? (Attach laboratory results) Yes
- *5. Which solid waste management facility is the request for (name of landfill and permit number, incinerator, etc...)? FMC Corp. Permit 36-05
- *6. Specify how the waste will be delivered - in bulk or containers (i.e. barrels, bags, etc.) in fiber drums.



QUALITY CERTIFICATE

November 10, 1992

This letter is to certify that three Effluent Treatment System Filters with filter cake were submitted on 10/26/92 for free liquids testing per method 9095, Paint Filter Liquids Test, revision 3/85.

Sample #1 No Free Liquids

Sample #2 No Free Liquids

Sample #3 No Free Liquids

Analysis were performed by Tommie Jo Yates on 11/2/92. Chain of Custody Form attached.

Signed

William H. Bolivar

William H. Bolivar
Group Leader
FMC Quality Assurance Laboratory

Interoffice

CHAIN-OF-CUSTODY FORM
LITHIUM DIVISION CHEMICAL PLANT ENVIRONMENTAL SAMPLES

Submitted By: Renee Heilman Date: 10/26/92
 Received By: Roger Ross Date: 10/26/92
 (In Control Lab)

Analyses	Effluent	Upstream	Downstream	Analyzed By	Date
Flow (MGD)					
PH (units)					
TSR (mg/l)					
TDS (mg/l)					
Li (mg/l)					
F (mg/l)					
Se (mg/l)					
Cu (mg/l)					
BOD ₅ (mg/l)					
NH ₃ -N (mg/l)					
Total Chlorides					
Conductivity					
Temperature (C°)					
Chronic Toxicity					
Total Nitrogen					
Total Phosphorus					

Special Samples

Description	Determination(s)	Analyzed By	Date
Sample #1	Paint Filter Test	Jay	11/2/92
Sample #2	Paint Filter Test		
Sample #3	Paint Filter Test		

Comments:

Effluent Treatment System filtercake (Decomposed and Neutralized Lithium Hypochlorite solution and filter sd)

TEST REPORT NO. A82673

September 28, 1992

Prepared for:

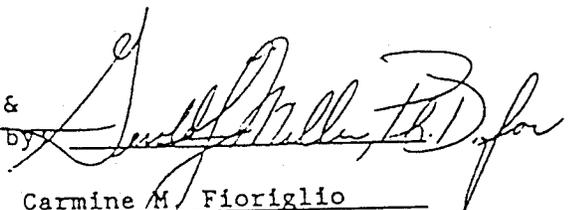
FMC Lithium
Highway 161
Bessemer City, NC 28016

Attention: Art Gillespie

Project: Filter Tubes

EFFLUENT TREATMENT SYSTEM FILTERS, WITH
FILTER CAKE.

Reviewed &
Approved by


Name: Carmine M. Fioriglio

Title: QA/QC Manager

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I. CertificationAnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission *	
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

II. Definition of Terms

<u>Term</u>	<u>Definition</u>
D	Detected; result must be greater than zero.
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate.
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
NTU	Nephelometric Turbidity Units
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
ppb	Parts-per-billion; may be converted to ppm by dividing by 1,000.
ppm	Parts-per-million; may be converted to ppb by multiplying by 1,000.
ug/l	Micrograms of constituent per liter of sample; equivalent to parts-per-billion.
ug/kg	Micrograms of constituent per kilogram of sample; equivalent to parts-per-billion.
ug/kg dw	Micrograms of constituent per kilogram of sample reported on a dry weight basis.
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
B	Analyte detected in associated blank as well as the sample. It indicates possible/probable blank contamination.

III. Sample Designations

<u>AnalytiKEM Designation</u>	<u>Client Designation</u>	<u>Matrix</u>	<u>Date Sampled</u>
A82673-1	#1	Nonaqueous	09/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

IV. Methodology

General Chemistry

Method 9095, Paint Filter Liquids Test, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, Second Edition, USEPA.

General ChemistrySample Designation

<u>Parameter</u>	<u>Method</u> <u>Blank</u>	A82673-1 <u>#1</u>
Paint Filter Test	--	Fail
Units	(ug/kg)	(ug/kg)

NOTE: This Material Was removed from the filter tubes without proper draining. Three additional Paint Filter Tests performed on properly drained filters did pass. They are attached.

a.s.g.

12-7-92

TEST REPORT NO. A82673

September 28, 1992

Prepared for:

FMC Lithium
Highway 161
Bessemer City, NC 28016

Attention: Art Gillespie

Project: Filter Tubes

Reviewed &
Approved by

Name: Carmine M. Fioriglio

Title: QA/QC Manager

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AnalytiKEM

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II. Definition of Terms

<u>Term</u>	<u>Definition</u>
DI	Deionized Water
J	Compound was detected at levels below the practical quantitation limit. The level reported is approximate.
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NA	Analysis not applicable to the sample matrix.
ND	Not Detected
NR	Not Requested
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
U	Compound was analyzed for but not detected. The preceding number is the practical quantitation limit for the compound.
mg/L	Milligrams of constituent per liter of TCLP Leachate; equivalent to parts-per-million (ppm).
CCC	Calibration Check Compound; used to verify the precision of a GC/MS calibration curve.
SPCC	System Performance Check Compound; used to verify the correct operation of a GC/MS instrument.
PQL	Practical Quantitation Limit; the minimum level at which compounds can be dependably quantitated.
TCLP	Toxic Characteristic Leachate Procedure
ZHE	Zero Headspace Extraction
TC	Toxic Characteristic
ug	Micrograms

I. Certification

AnalytiKEM, Inc.
Current Certifications/Regulatory Approvals

Tabulated below are the current laboratory certifications that are held by each AnalytiKEM Laboratory. Analyses performed at multiple AnalytiKEM locations will be noted in the test report.

Cherry Hill, NJ		Rock Hill, SC		Houston Analytical, TX	
State	Cert #	State	Cert #	State	Cert #
Arkansas	*	S. Carolina	46067	N. Dakota	R-006
Connecticut	PH-0715	N. Carolina	316	Oklahoma	8403
Florida	880985G	New Jersey	79795	Texas Water Commission	*
Massachusetts	NJ117			Louisiana	92-07
New Jersey	04012			S. Carolina	82011
New York	10815			N. Carolina	367
N. Carolina	258			Wisconsin	998010530
N. Dakota	R-038			New Jersey	82869
Pennsylvania	68366				
S. Carolina	94004				
Tennessee	02908				
Vermont	*				
Oklahoma	9107				

* No certification numbers are issued for these states.

III. Sample Designations

<u>AnalytiKEM Designation</u>	<u>Client Designation</u>	<u>Matrix</u>	<u>Date Sampled</u>
A82673-1	#1	Nonaqueous	09/16/92

Note: Samples will be held for 30 days beyond the test report date unless otherwise requested.

IV. Methodology

All analysis are performed in accordance with methodologies found in the following publications:

- Federal Register, Vol. 55, No. 126, June 29, 1990.
- 40 CFR, Part 216, Appendix 2, Method 1311.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Second Edition, 1982.
- Test Methods for Evaluating Solid Waste, USEPA, SW-846, Third Edition, 1982.
- Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, USEPA, March 1983.

V. Laboratory Chronicle

	<u>DATE</u>	
	I	II
Date Sampled	<u>09/16/92</u>	_____
Receipt/Refrigeration	<u>09/16/92</u>	_____
<u>TCLP Extractions</u>		
TC Extraction	<u>09/17/92</u>	_____
<u>Sample Preparations</u>		
Metals:		
General	<u>09/18/92</u>	_____
Mercury	<u>09/18/92</u>	_____
Furnace	<u>09/18/92</u>	_____
<u>Analyses</u>		
Metals:		
General	<u>09/18/92</u>	_____
Mercury	<u>09/18/92</u>	_____
Furnace	<u>09/18/92</u>	_____

Laboratory Manager
Review & Approval

(Signature) *Gregory A. Pruna*
 (Printed Name) Gregory A. Pruna
 (Date) 09-28-92

NOTE: If fractions are reextracted and reanalyzed because the initial endeavors failed to meet the required quality control criteria, the dates of reextraction and/or reanalysis will be entered in column II additionally.

VI. Extraction Log

Sample
Designation

TCLP
Extraction, (g)

Extraction Fluid
Type Volume (ml)

A82673-1

100

1 2,000

VII. Outlier Summary: Toxicity Characteristic Leachate Procedure (TCLP)

No Compounds were reported above the Regulatory Limits for the following samples:

A82373-1 #1

VIII. Analytical ResultsTCLP Metals

AnalytiKEM

AnalytiKEM Designation: A82673-1Client Designation: #1

<u>EPA Number</u>	<u>Parameter</u>	<u>Method Blank</u>	<u>Sample Result</u>	<u>Regulatory Level</u>
D004	Arsenic	0.35 U	0.35 U	0.50
D005	Barium	5.6 U	1.1 J	10
D006	Cadmium	0.062 U	0.062 U	0.10
D007	Chromium	0.36 U	0.36 U	0.50
D008	Lead	0.36 U	0.36 U	0.50
D009	Mercury	0.020 U	0.020 U	0.020
D010	Selenium	0.056 U	0.056 U	0.10
D011	Silver	0.16 U	0.16 U	0.50
Units		(mg/l)	(mg/l)	(mg/l)

Note: All results are corrected for spike recoveries.

IX. Quality Control Data

TCLP Procedure

AnalytiKEM

Metals

Aqueous Matrix Spike Recovery Data

Sample Spiked A82673-1

<u>Parameter</u>	<u>Amount of Spike</u>	<u>Recovery MS</u>
Arsenic	300	86
Barium	300	89
Cadmium	300	80
Chromium	300	84
Lead	300	82
Mercury	200	99
Selenium	300	90
Silver	300	44
Units	(ppb)	(%)

Chain-of-Custody Record

82673

Program Area: Drinking Water Wastewater Groundwater Solid and Hazardous Waste

Client: FMC Lithium

Sample Collector: M. G. La

Project: Filter Tubes

AnalytIKEM Contact: Gleg Whitman

Laboratory
2324 Vernsdale Road
Rock Hill, South Carolina 29731
(803) 324-5310
Fax: (803) 324-8378

Sales Office
454 South Anderson Road BIC5
Rock Hill, South Carolina 29730
(803) 329-9690
Fax: (803) 329-9689

ITEM NUMBER	SAMPLE DESIGNATION	DATE	TIME	MATRIX	Grab or Composite	40 ml vials	0.50 ml Unpres.	HNO ₃	H ₂ SO ₄	NaOH	HCL	Filter	PARAMETERS
1	#1	9/16	12:30	Am Ag	G								A.C. TCIP Metals
2													TCIP Ext.
3													Paint Filter
4													
5													
6													
7													
8													
9													
10													

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME	REMARKS
1	1	<u>Pras Arora</u>	<u>M. G. La</u>	9/16	12:30	
2		<u>Whitman</u>	<u>G. La</u>	9/16	3:15	
3						
4						SAMPLER'S SIGNATURE

3

Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
Permit No. 36-05
June 1996

SITE CHARACTERIZATION

Waste Disposal Footprint

A site plan indicating the boundaries of waste disposal on the property follows.

Note: Site Plan scanned under separate cover (H)

Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
Permit No. 36-05
June 1996

SITE CHARACTERIZATION

PERMITTED BOUNDARIES

The site plan included in the 1977 permit application follows.
As you will note, distinct boundaries for waste disposal are not
indicated.

Note: Site Plan ^{scanned} under Seperate Cover (y)

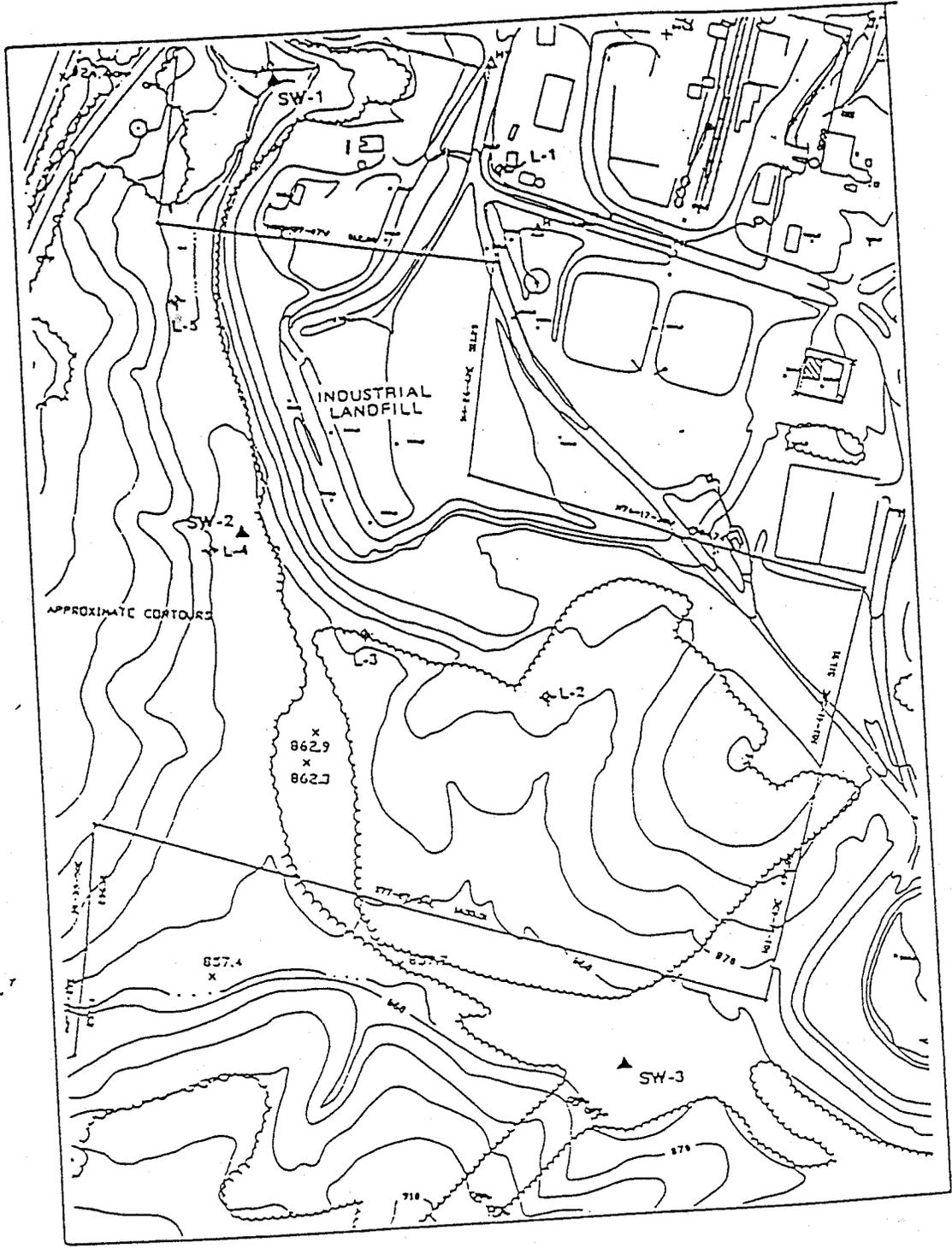
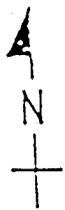
Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
Permit No. 36-05
June 1996

SITE CHARACTERIZATION

MONITOR WELL LOCATIONS

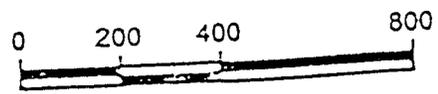
Attached is a map showing the location of the five landfill monitoring wells and three stormwater canal sampling locations. Well logs for these five wells are also included here.

Also attached is a copy of the map generated during the RCRA Facility investigation and submitted to the North Carolina Division of Solid and Hazardous Waste pursuant to the provisions of FMC's hazardous waste permit. While the boundaries of the landfill do not appear to be entirely accurate as depicted here, the map shows the location of all monitoring wells and sample locations for the extensive RCRA investigation. Well logs for all the site groundwater monitoring wells are available upon request.



EXPLANATION

- ▲ SURFACE WATER SAMPLING STATION
- ✦ MONITORING WELL



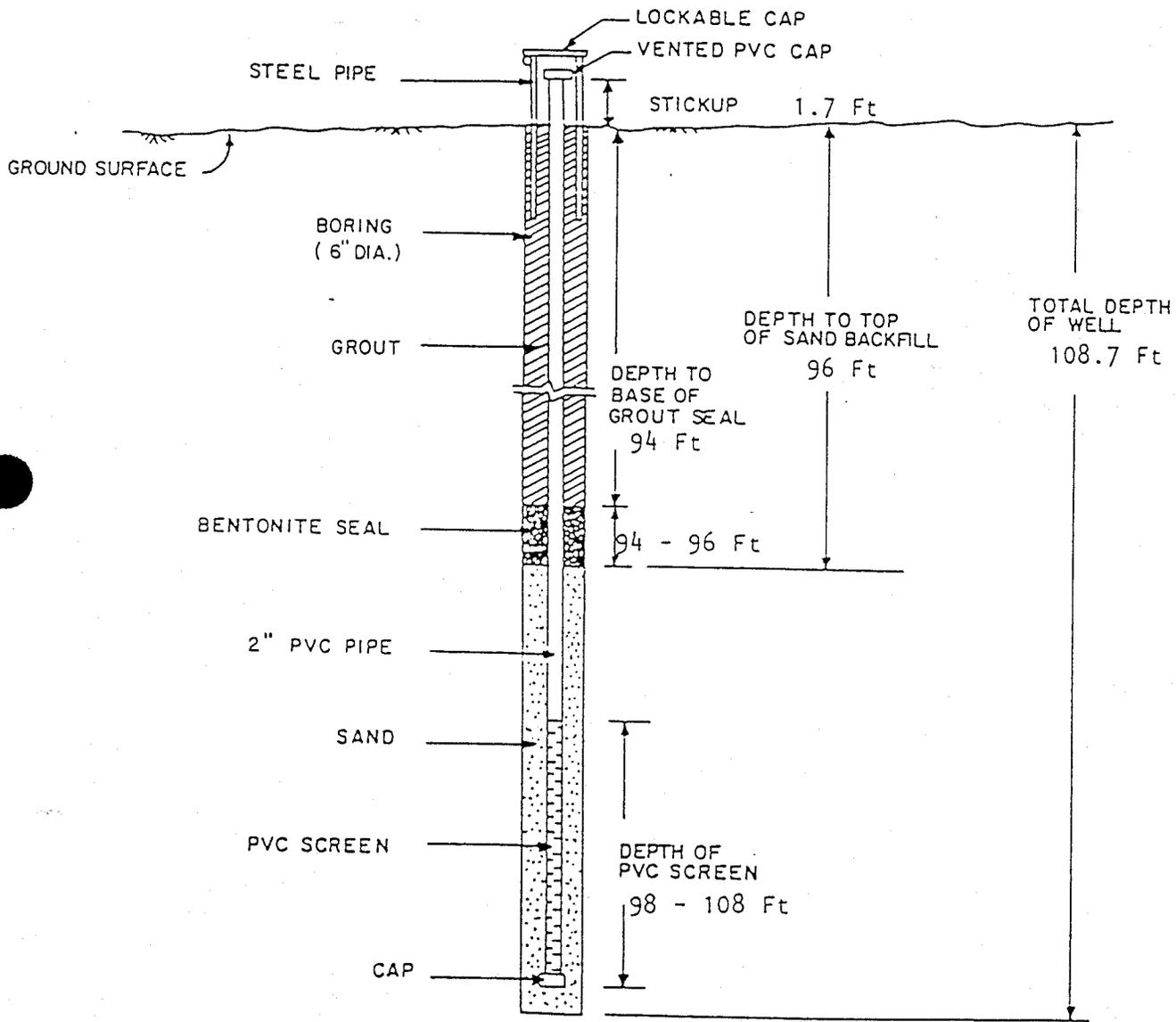
SCALE IN FEET

FMC CORPORATION - LITHIUM DIVISION BESSEMER CITY FACILITY
EBASCO SERVICES INCORPORATED
INDUSTRIAL LANDFILL AREA

FIGURE 1

GROUND-WATER MONITORING WELL INSTALLATION RECORD

NAME Lithco/Sanitary Landfill JOB NUMBER CHW 7110
 WELL NUMBER LFW-1 GROUND SURFACE ELEVATION N/A
 LOCATION Northwest of Present Landfill Pit
 INSTALLATION DATE 7/15/89



NOTE: ALL PVC PIPE JOINTS HAVE SCREW CONNECTORS

LFW-1

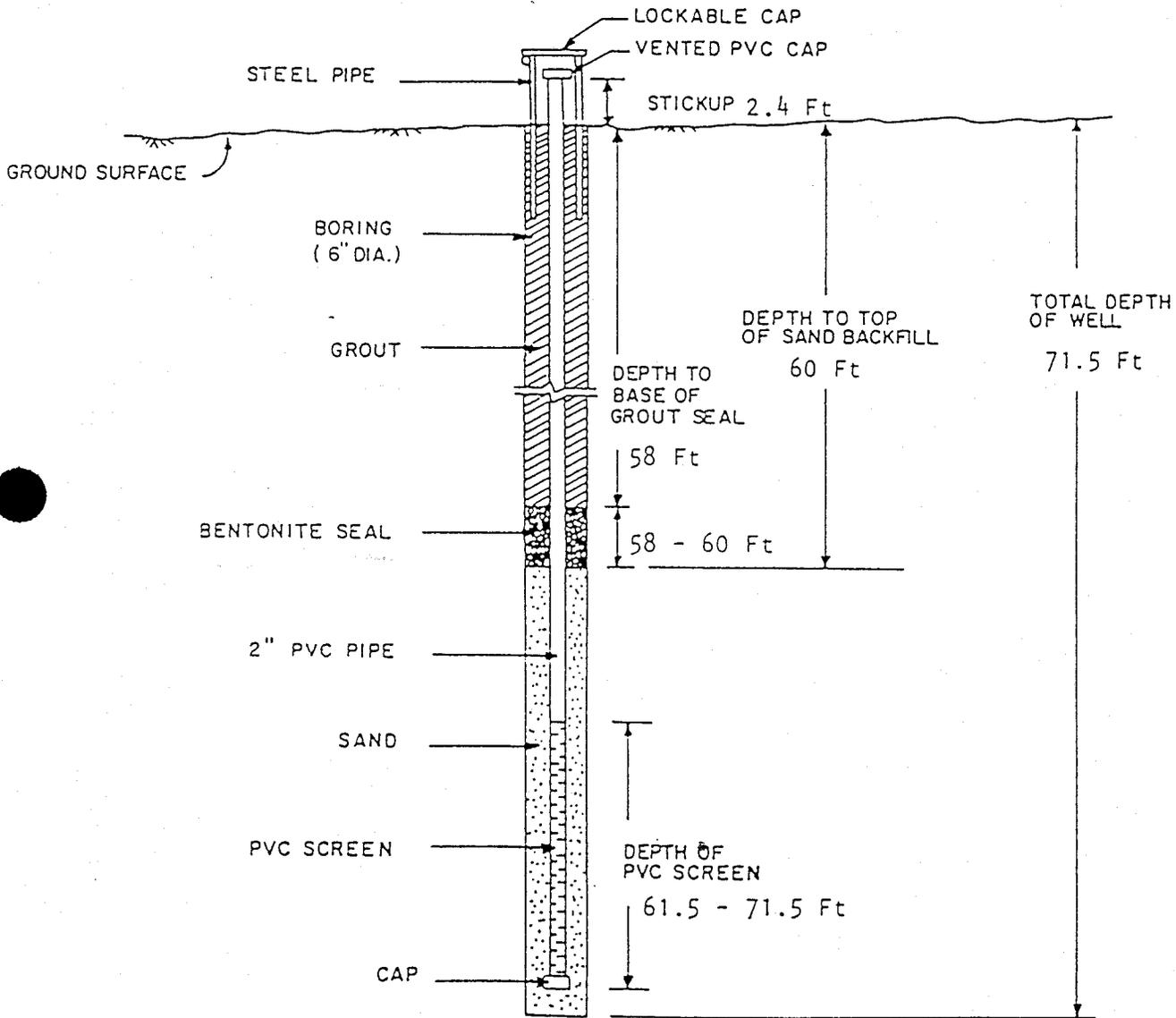


LAW ENGINEERING
CHARLOTTE, NORTH CAROLINA

GROUND-WATER MONITORING
WELL INSTALLATION RECORD

GROUND-WATER MONITORING WELL INSTALLATION RECORD

NAME Lithco/Sanitary Landfill JOB NUMBER CHW 7110
 WELL NUMBER LFW-2 GROUND SURFACE ELEVATION N/A
 LOCATION Southwest of Present Landfill Pit
 INSTALLATION DATE 7/11/89



NOTE: ALL PVC PIPE JOINTS HAVE SCREW CONNECTORS

LFW-2

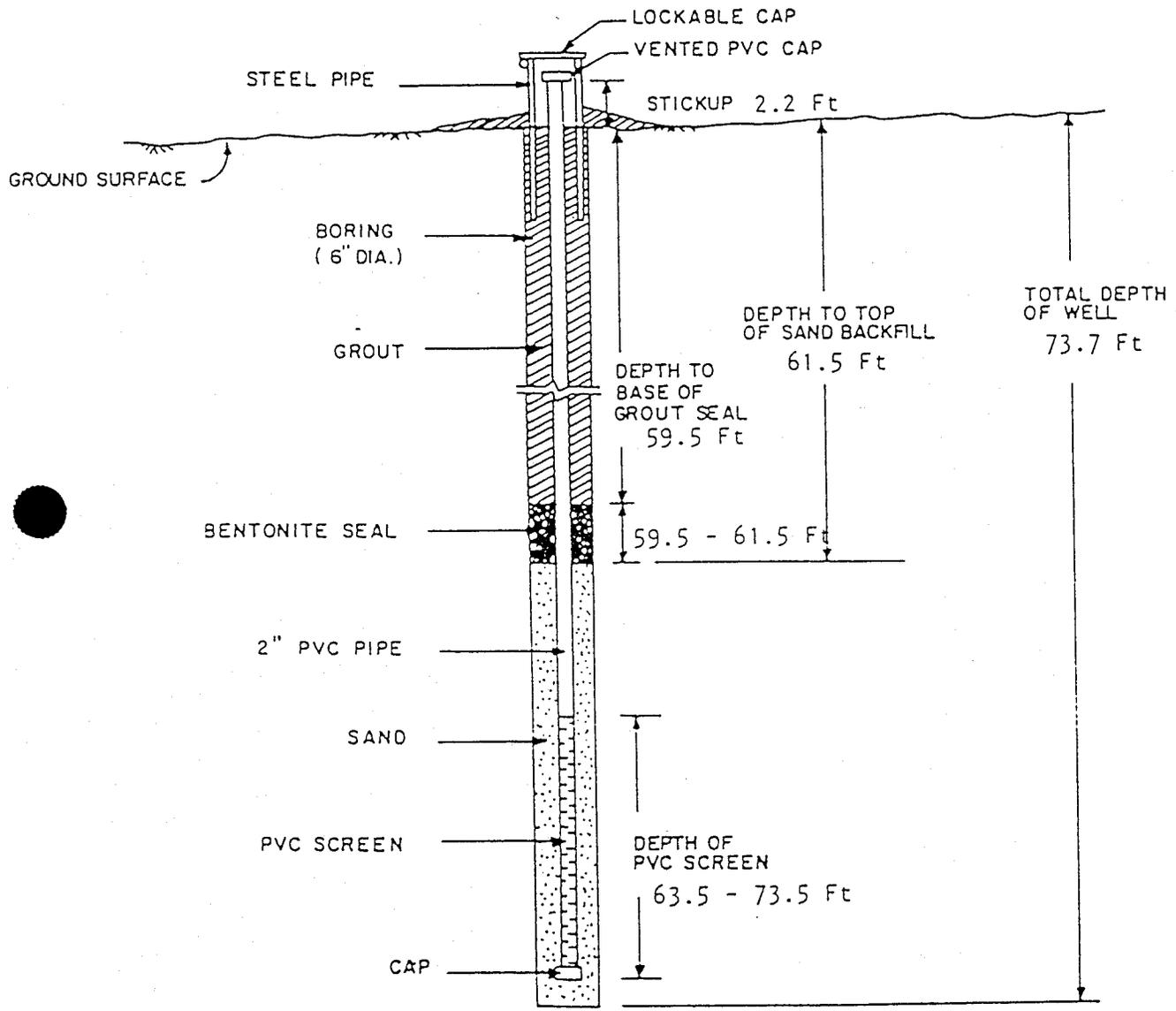


LAW ENGINEERING
 CHARLOTTE, NORTH CAROLINA

GROUND-WATER MONITORING
 WELL INSTALLATION RECORD

GROUND-WATER MONITORING WELL INSTALLATION RECORD

NAME Lithco/Sanitary Landfill JOB NUMBER CHW 7110
 NUMBER LFW-3 GROUND SURFACE ELEVATION N/A
 LOCATION South of Present Landfill Pit
 INSTALLATION DATE 7/12/89

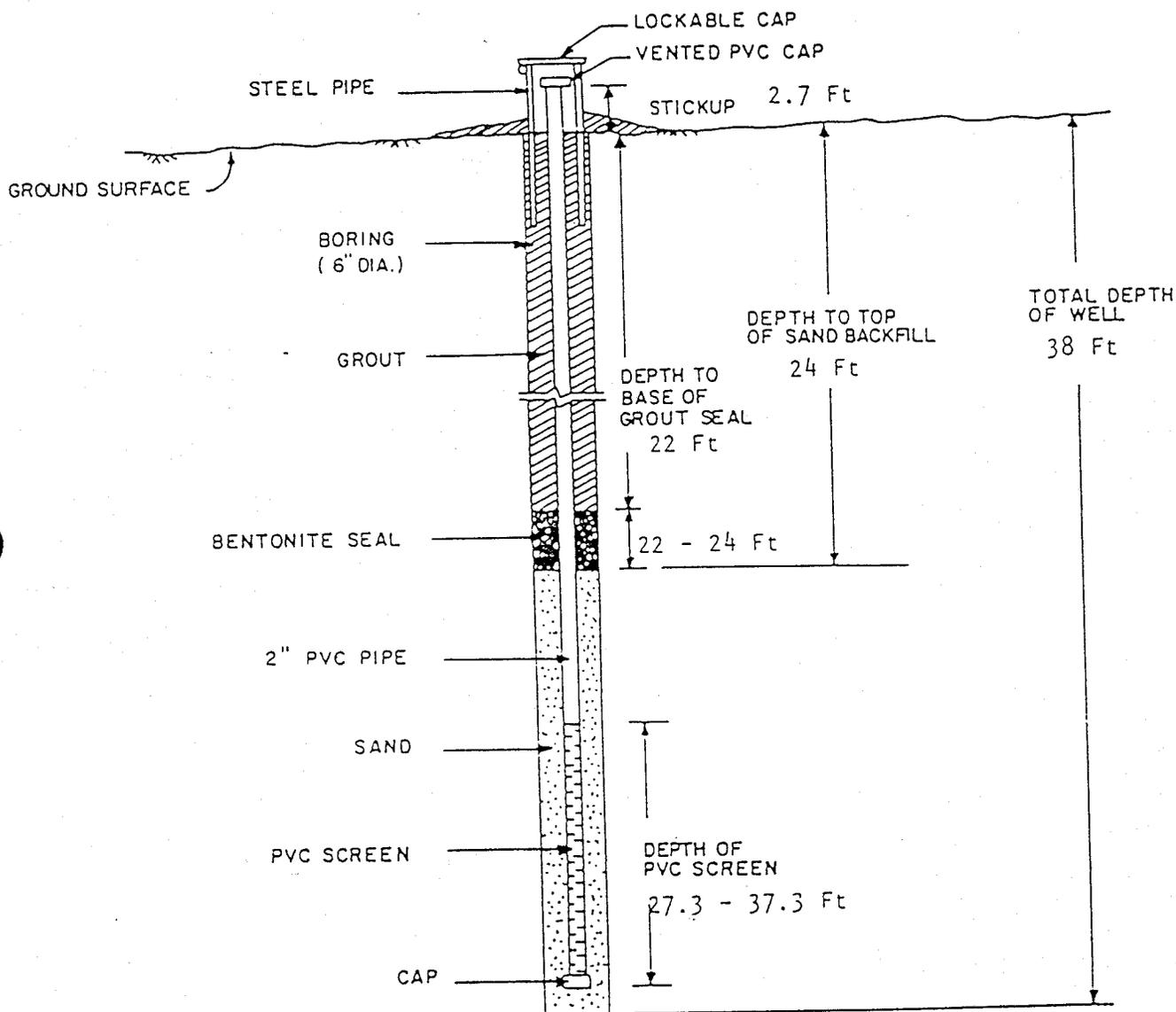


NOTE: ALL PVC PIPE JOINTS HAVE SCREW CONNECTORS

 LFW-3	LAW ENGINEERING CHARLOTTE, NORTH CAROLINA	GROUND-WATER MONITORING WELL INSTALLATION RECORD
--	--	---

GROUND-WATER MONITORING WELL INSTALLATION RECORD

JOB NAME Lithco/Sanitary Landfill JOB NUMBER CHW 7110
 WELL NUMBER LFW-4 GROUND SURFACE ELEVATION N/A
 LOCATION Southeast of Present Landfill Pit
 INSTALLATION DATE 7/14/89



NOTE: ALL PVC PIPE JOINTS HAVE SCREW CONNECTORS

LFW-4

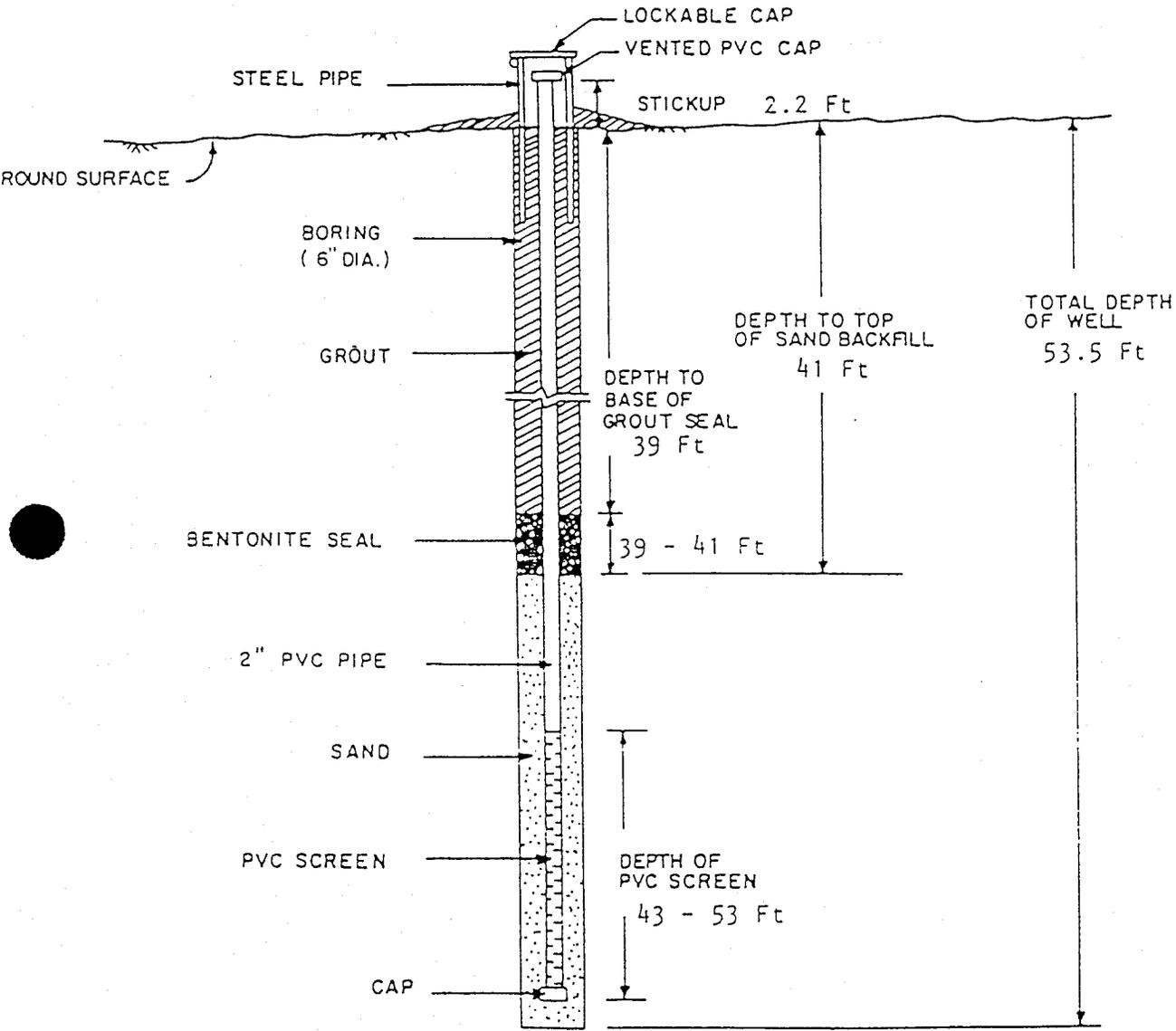


LAW ENGINEERING
 CHARLOTTE, NORTH CAROLINA

GROUND-WATER MONITORING
 WELL INSTALLATION RECORD

GROUND-WATER MONITORING WELL INSTALLATION RECORD

SITE NAME Lithco/Sanitary Landfill JOB NUMBER CHW 7110
 WELL NUMBER LFW-5C GROUND SURFACE ELEVATION N/A
 LOCATION Northeast of Present Landfill Pit
 INSTALLATION DATE 7/14/89



NOTE: ALL PVC PIPE JOINTS HAVE SCREW CONNECTORS

<p>LFW-5C</p>	 <p>LAW ENGINEERING CHARLOTTE, NORTH CAROLINA</p>	<p>GROUND-WATER MONITORING WELL INSTALLATION RECORD</p>
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4

Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
Permit No. 36-05
June 1996

ANALYSIS OF GROUNDWATER MONITORING RESULTS

MONITORING UNDER THE LANDFILL PERMIT

Attached is the approved groundwater monitoring plan for the solid waste landfill. Additionally, included is a copy of report on the most recent round of monitoring. With each report on monitoring events, data is tabulated against historical results. As has been historically demonstrated, down gradient wells L-2 through L-5 show contaminants at levels below those found in upgradient well L-1.



North Carolina Department of Human Resources
Division of Health Services
P.O. Box 2091 • Raleigh, North Carolina 27602-2091

James G. Martin, Governor
David T. Flaherty, Secretary

Ronald H. Levine, M.D., M.P.H.
State Health Director

May 11, 1989

Mr. Arthur S. Gillespie, Jr.
Environmental Manager
Lithium Corporation of America
P.O. Box 795
Bessimer City, N.C. 28016

RE: Proposed G.W. Monitoring Plan for Lithium Corporations Sanitary
Landfill (Permit #36-05).

Dear Mr. Gillespie:

Upon further communication today with Law Engineering, the above
referenced plan is approved with the following conditions:

1. Five monitoring wells will be installed (instead of six)
and screened in the saprolite, rather than bracketed into
the water table as proposed.

If you have further questions or comments, please advise.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "M. J. Babuin".

Michael L. Babuin, P.G.
Solid Waste Hydrogeologist
Solid Waste Branch
Solid Waste Management Section

MLB/mj

cc: Bobby Lutfy
Jim Coffey
Rick Doby



LAW ENGINEERING

GEOTECHNICAL, ENVIRONMENTAL
& CONSTRUCTION MATERIALS
CONSULTANTS

February 7, 1989

Lithium Corporation of America
Highway 161
P. O. Box 795
Bessemer City, North Carolina 28016-0795

Attention: Mr. Arthur S. Gillespie, Jr.

Subject: Proposal to Implement Ground-Water Monitoring Plan
Lithco/FMC Plant Landfill Site
Bessemer City, North Carolina
Law Proposal No. 607E8

Gentlemen:

Law is pleased to submit this proposal to implement a ground-water monitoring plan for the subject site. Included in this proposal is an outline of our understanding of the project information, proposed scope of services, fee estimate and schedule.

PROJECT INFORMATION

We understand that Lithco is interested in having ground-water monitoring wells installed in close proximity to the on-site sanitary landfill in response to a requirement of the North Carolina Solid Waste Management Section of the Department of Human Resources. This landfill area slopes downward from east to west towards an unnamed drainage feature.

Our understanding of the project information is based on conversations between Mr. Arthur Gillespie of Lithco and our Mr. Tom Bolyard and on a site visit by Mr. Bolyard.

PROPOSED SCOPE OF SERVICES

We propose to drill five soil test borings at the approximate locations shown on the Proposed Monitoring Well Location Map (Figure 1).

The borings will be drilled by mechanically advanced hollow-stem steel augers. Soil sampling and penetration testing will be performed in general accordance with ASTM D 1586. Soil samples will be obtained at regular intervals with a standard 1.4-inch I.D., 2-inch O.D., split-tube sampler. Representative portions of the soil samples thus obtained will be placed in glass jars and transported to our laboratory where they will be examined by a geologist or geotechnical engineer to verify the driller's field classifications.

Monitoring Well Installation

Type-II monitoring wells will be constructed in each of the boreholes resulting from auger drilling. These wells will be terminated approximately ten feet below the existing ground-water table, which will be estimated at the time of drilling. The proposed well construction consists of 2-inch diameter PVC pipe and screen, washed sand filter pack to above the screened interval, bentonite seal and finally, bentonite/cement grout to the surface. A lockable protective metal cover will be placed over each well. Figure 2 illustrates a typical Type II monitoring well installation.

A permit for these well installations is required from the North Carolina Division of Environmental Management (DEM). Law Engineering will prepare and submit the permit application on your behalf.

Well Development and Sampling

Following equilibrium of water levels in the newly installed monitoring wells, water levels will be measured with an electric water level indicator to determine depth to the water surface. The measured value will be used in conjunction with the total casing depth to determine the height of the water column. The volume of water standing in each well will then be calculated. Representative ground-water samples will be collected following evacuation by bailing at least six times the volume of water within the wells or to dryness twice, in accordance with our understanding of current DEM guidelines.

The wells will be sampled using bailers constructed of 3-ft long, 1.6-inch diameter teflon pipe. To minimize the potential for cross-contamination between wells, the bailers will be cleaned with laboratory soap, rinsed with distilled water, rinsed with dilute hydrochloric acid and finally, rinsed with distilled water before developing and sampling each well.

Immediately prior to recovery of water samples from the wells, pH, temperature and specific conductivity measurements will be recorded in the field. Measurement of the sample temperature will be made using a mercury thermometer, field measurement of pH will be conducted with a portable pH meter and specific conductivity will be measured with a conductivity meter. The water samples will be labeled, appropriately preserved and shipped to Law Environmental National Laboratories in Kennesaw, Georgia where the samples will be analyzed for volatile organic compounds (EPA Method 8240), Lithium, Berillium and 8 heavy metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver). Chain-of-custody procedures will be followed.

Test results will be reported to the Environmental Health Section of the Solid and Hazardous Waste Management Branch within 15 days of receipt from the laboratory.

Annual sampling of the monitoring wells, laboratory testing and reporting to the state will be conducted in a manner similar to that previously described.

Sincerely,

LAW ENGINEERING

Ronald C. Gilkerson

Ronald C. Gilkerson
Staff Geologist

Thomas H. Bolyard, P.G.

Thomas H. Bolyard, P.G.
Manager, Environmental Services

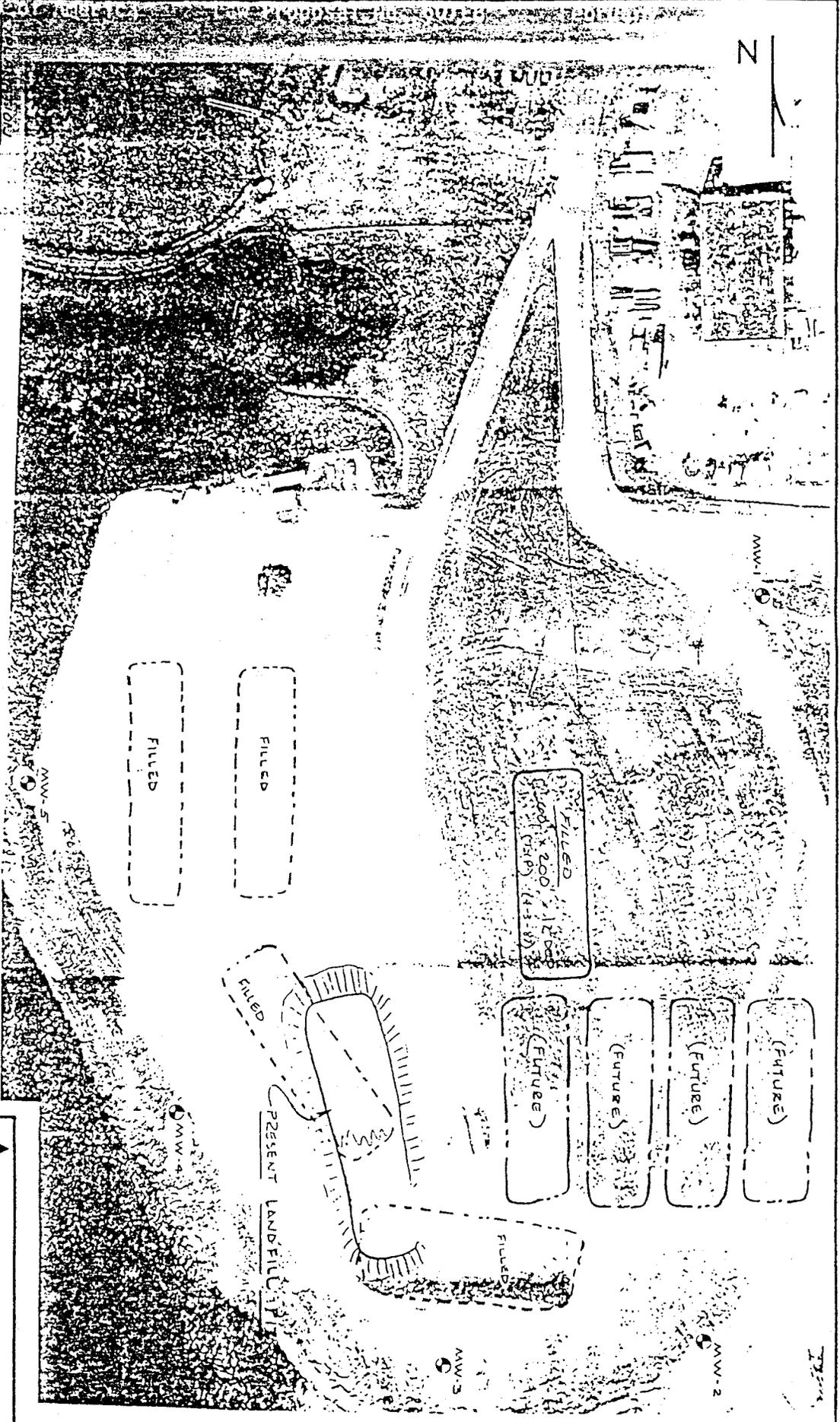
Robert E. Smith, Jr.

Robert E. Smith, Jr., P.E.
Chief Engineer

RCG/THB/RES:krh

Attachments: Figures

N



LOCATION OF PROPOSED MONITORING WELL

AERIAL PHOTOGRAPH, LITHIUM CORP. OF AMERICA, DATED 2-18-84

0 120
APPROX SCALE, FT

 <p>LAW ENGINEERING CHARLOTTE, NORTH CAROLINA</p>	PROPOSED MONITORING WELL LOCATION MAP
	LITHIUM SITE BESSEMER CITY, NORTH CAROLINA
JOB NO.	FIGURE

Lithium Corporation of America

LITHCO

A subsidiary of FMC Corporation

PO Box 795 Highway 161
Bessemer City, NC 28804

May 5, 1989

Mr. Michael L. Babuin
Solid Waste Hydrogeologist
Solid Waste Branch
Solid Waste Management Section
Division of Health Services
P. O. BOX 2091
Raleigh, North Carolina 27602-2091

Dear Mr. Babuin:

Please refer to your letter of March 17, 1989 regarding our proposal for installing a system of groundwater monitoring wells at our Corporate Sanitary Landfill. (Permit #36-05).

The hydrogeologic information that you requested is available from data collected from our 12 existing wells which were installed to determine the extent of contamination from the old Bermet hazardous waste site on the property. Please see the enclosed letter dated April 11, 1989 from Mr. Tom Bolyard of Law Engineering Company. I am also sending again the February 7, 1989 proposal for your consideration, along with this additional information.

As indicated in the Law Engineering Company proposal, we are proposing to test for volatile organic compounds (EPA Method 8240), lithium, beryllium, and 8 heavy metals (As; Ba; Cd; Cr; Pb; Hg; Se; Ag). The methods and detection limits are presented in the attached table which was copied from a 1988 monitoring report.

We are now proposing to install six monitoring wells instead of the five originally proposed. We believe the April 11 letter from Law Engineering Company answers your questions of March 17. We request your early approval of the plan so that we may proceed to get Corporate expenditure authorizations and then have the wells installed and tested before July 1, 1989.

Sincerely yours,


Arthur S. Gillespie, Jr.
Environmental Manager

cc: M. W. Stark
J. L. Larson
T. H. Bolyard-Law Engineering

**LAW ENGINEERING**GEOTECHNICAL, ENVIRONMENTAL
& CONSTRUCTION MATERIALS
CONSULTANTS

April 11, 1989

Lithium Corporation of America/FMC
Highway 161
P. O. Box 795
Bessemer City, North Carolina 28016-0795

Attention: Mr. Arthur S. Gillespie, Jr.

Subject: Proposed Ground-Water Monitoring Plan
Lithium Corporation Sanitary Landfill
Bessemer City, North Carolina
Law Proposal No. 089E9

Gentlemen:

The purpose of this letter is to provide a summary of site-specific information regarding ground-water monitoring wells previously installed by Law Engineering at the subject facility in response to a March 17, 1989 letter from Mr. Michael L. Babuin of the North Carolina Solid Waste Management Section. In this letter, and in a subsequent telephone conversation, Mr. Babuin outlined the State's concern that additional hydrogeologic information would be necessary to characterize the site prior to their approval of the above-referenced ground-water monitoring plan. This review of available site-specific information will hopefully negate the necessity of implementing an exploratory boring program in the vicinity of the sanitary landfill.

A total of 12 monitoring wells have been installed at the Lithco site by Law Engineering. Table 1 presents a summary of information for these wells. In-situ permeability testing has been conducted in eight of the monitoring wells, with the results summarized in Table 2. Hydraulic conductivity values computed for the site range from 1.5×10^{-4} centimeters per second (cm/sec) to 3.4×10^{-3} cm/sec. The lithologic materials intercepted by the screened intervals in these wells is varied and includes alluvium, residuum, partially weathered rock and bedrock.

There appears to be no significantly higher conductive zones within the lithologies penetrated by these wells. The variation in permeability across the site appears to be largely related to the relative quantities of silt and sand in the subsurface material.

A three-well cluster on site has indicated a vertical gradient of approximately one foot. This supports the premise that a single unconfined aquifer exists at this site.

Lithium Corporation of America/FMC

Law Proposal No. 089E9

April 11, 1989

Based on a review of available information for the site, we recommend that at least one additional wells be added to the four proposed wells downgradient from the landfill area. This well would be drilled to auger refusal (i.e., top of rock) with the bottom 10 ft screened. This would enable the detection of potential constituents more dense than water. The five wells originally proposed would have 10 ft screen that would bracket the stabilized water table, which would be determined at the time of their installation.

We believe the information characterizing the hydrogeology of the site obtained from previous monitoring wells installed by Law provides an adequate basis to propose a ground-water monitoring plan for the sanitary landfill area. This information has been summarized in this letter in an attempt to address the State's concerns identified in their March 17, 1989 letter to Mr. Gillespie. Please contact us if you have any questions concerning this material or if further discussion is needed.

Sincerely,

LAW ENGINEERING


Thomas H. Bolyard, P.G.
Manager, Environmental Services

THB:krh

TABLE 1
 SUMMARY OF WELL INFORMATION
 LITHCO FACILITY
 BESSEMER CITY, NORTH CAROLINA
 LAW JOB NO. CHW 5852

<u>Well Number</u>	<u>Total Depth</u>	<u>Ground Surface Elevation (ft)¹</u>	<u>Water Level Depth (ft)²</u>	<u>Water Level Elevation (ft)</u>
W-1	27.0	889	25.08	863.92
W-2	23.5	878	15.16	862.84
W-3	48.5	915	41.28	873.72
W-4	100.0	878	15.56	862.44
W-5	50.0	897	38.26	858.74
W-6	45.0	916	NA	NA
W-7	38.5	970	NA	NA
W-8	102.0	878	16.32	861.68
W-9	22.0	861	11.55	849.45
W-10	41.0	861	11.78	849.22
W-11	73.0	878	25.01	852.99
W-12	79.0	878	23.47	854.53

¹ Approximate Elevation

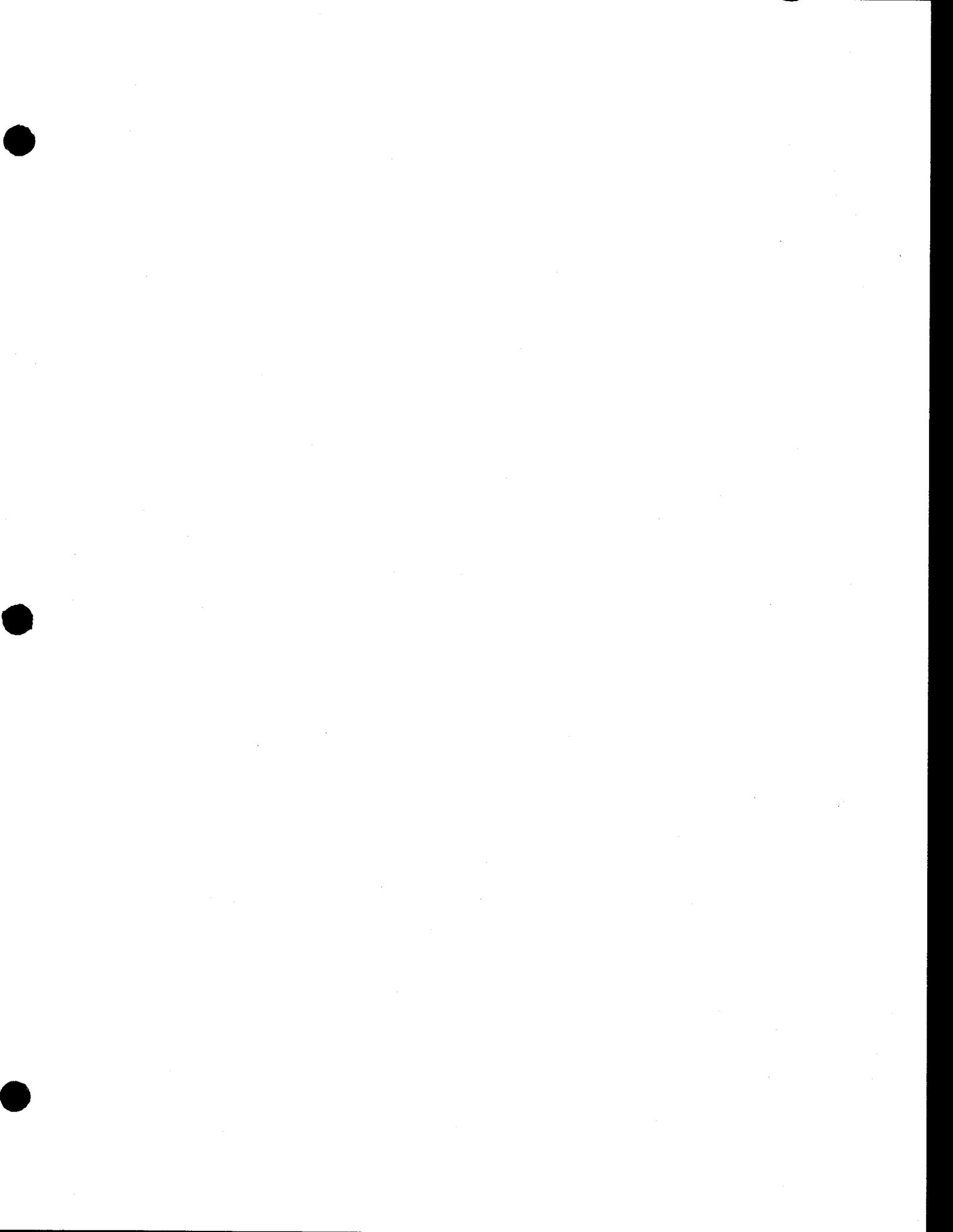
² Measured on 07/21/88

MAY 05 1989 14:22

P.5

TABLE 2
SUMMARY OF IN-SITU PERMEABILITY TESTING
LITHCO FACILITY
BESSEMER CITY, NORTH CAROLINA
LAW JOB NO. CHW 5852

<u>Well Number</u>	<u>Approximate Elevation of Screened Interval (ft)</u>	<u>Hydraulic Conductivity K (cm/sec)</u>
W-4	786.5 - 796.5	1.6×10^{-3}
W-5	851.0 - 861.0	1.0×10^{-3}
W-6	874.1 - 884.1	1.5×10^{-4}
W-7	949.3 - 959.3	6.3×10^{-4}
W-8	776.0 - 786.0	3.4×10^{-3}
W-9	843.0 - 853.0	1.9×10^{-3}
W-10	820.0 - 830.0	4.8×10^{-4}
W-12	799.0 - 809.0	1.0×10^{-3}



FMC Corporation

Lithium Division
Highway 161
Box 795
Bessemer City North Carolina 28016
704 868 5300 Fax 704 868 5496

FMC

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

June 3, 1996

North Carolina Department of Environment,
Health, and Natural Resources
Solid Waste Management Section
P.O. Box 27687
Raleigh, NC 27611-7687

Attn: Mr. Robert Lufty

Re: Semiannual Monitoring - Landfill Permit No. 36-05

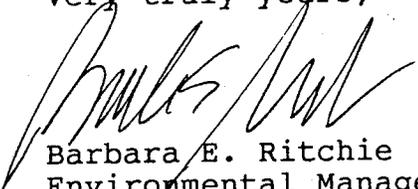
Dear Mr. Lufty:

FMC Corporation's Lithium Division facility in Bessemer City, North Carolina ("FMC") is providing the North Carolina Department of Environment, Health, and Natural Resources ("DEHNR") with the results of the semiannual monitoring of groundwater and surface drainage for FMC's industrial landfill, No. 36-05. Enclosed with this letter are the following documents:

1. Summary tables of historical and current monitoring results for the five groundwater monitoring wells and three surface drainage sampling locations.
2. A map identifying sampling locations.
3. Laboratory data and sample chain of custody reports.

The next scheduled sampling event is in December 1996. If you have any questions or require additional information, please call me at 704/868-0806.

Very truly yours,


Barbara E. Ritchie
Environmental Manager

Encl.

Table 1
 Industrial Landfill Area: Groundwater
 Summary of Volatile Organic Analysis

Concentrations in ppb (µg/l)

Upgradient of Landfill						
Monitoring Well	Sampling Date	Tetrachloroethene	Chloroform	Methylene Chloride	Bromoform	
L-1	7/89	36	<5	<5	9.6	
	7/90	69	10	<5	17	
	9/91	82	12	<5	9	
	7/92	110	16	<5	11	
	5/93	110	21	<5	9	
	11/93	100	19	<5	6	
	6/94	83	34	<5	7	
	12/94	98	41	<5	6	
	5/95	93	37	<5	7.7	
	12/95	210	56	<5	7.5	
	5/96	190	60	<5	8.5	

Downgradient of Landfill						
Monitoring Well	Sampling Date	Tetrachloroethene	Chloroform	Methylene Chloride	Bromoform	
L-2	7/89	<5	<5	<5	<5	
	7/90	<5	<5	<5	<5	
	9/91	<5	<5	<5	<5	
	7/92	<5	<5	<5	<5	
	5/93	<5	<5	<5	<5	
	11/93	<5	<5	<5	<5	
	6/94	<5	<5	<5	<5	
	12/94	<5	<5	<5	<5	
	5/95	<5	<5	<5	<5	
	12/95	<5	<5	<5	<5	
	5/96	<5	<5	<5	<5	
L-3	7/89	<5	<5	<5	<5	

Table 1 (cont.)

Monitoring Well	Sampling Date	Tetrachloroethene	Chloroform	Methylene Chloride	Bromoform	
L-3	7/90	<5	<5	<5	<5	
	9/91	<5	<5	<5	<5	
	7/92	<5	<5	<5	<5	
	5/93	<5	<5	<5	<5	
	11/93	<5	<5	<5	<5	
	6/94	<5	<5	<5	<5	
	5/95	<5	<5	<5	<5	
	5/95	<5	<5	<5	<5	
	12/95	<5	<5	<5	<5	
	5/96	<5	<5	<5	<5	
	L-4	7/89	67	<5	<5	<5
		7/90	48	<5	<5	<5
		9/91	87	<5	<5	<5
7/92		140	<5	<5	<5	
5/93		91	<5	<5	<5	
11/93		91	<5	<5	<5	
6/94		110	7	<5	<5	
12/94		140	5	<5	<5	
5/95		104	<5	<5	<5	
12/95		100	<5	<5	<5	
5/96		67	<5	<5	<5	
L-5		7/89	<50	<50	1,700	<50
		7/90	<5	<5	<5	<5
	9/91	<5	<5	<5	<5	
	7/92	<5	<5	<5	<5	
	5/93	<5	<5	<5	<5	
	11/93	<5	<5	<5	<5	
	6/94	<5	<5	<5	<5	
	12/94	<5	<5	<5	<5	
	5/95	<5	<5	<5	<5	
	12/95	<5	<5	<5	<5	
	5/96	<5	<5	<5	<5	

Note: Groundwater analysis for Volatile Organic Compounds using EPA method SW-846 8240.

Table 2
 Industrial Landfill Area: Groundwater
 Inorganic Analysis - RCRA Metals
 Concentrations in ppm (mg/l)

Upgradient of Landfill		As	Se	Hg	Ba	Cd	Cr	Pb	Ag
Monitoring Well	Sampling Date								
L-1	7/89	<0.005	<0.005	0.0003	<0.1	0.003	0.017	<0.005	<0.01
	7/90	0.035	<0.005	0.0022	0.71	<0.50	0.34	0.022	<0.03
	9/91	<0.005	<0.005	0.0030	0.27	<0.01	0.14	<0.005	<0.05
	7/92	<0.005	<0.005	0.0018	<0.10	<0.005	0.04	<0.005	<0.01
	5/93	0.050	<0.005	<0.0002	0.66	<0.005	0.32	0.015	<0.01
	11/93	<0.010	<0.005	<0.0015	<0.20	<0.005	<0.01	<0.015	<0.01
	6/94	<0.010	<0.005	0.7	0.24	<0.005	0.12	<0.003	<0.010
	12/94	0.042	0.005	0.0014	0.0417	0.0037	0.0551	0.0057	<0.001
	5/95	<0.005	0.007	<0.0002	0.039	<0.01	0.028	<0.005	<0.005
	12/95	<0.005	0.005	0.0013	<0.02	<0.01	<0.01	<0.005	0.01
5/96	<0.005	0.005	0.0008	<0.010	<0.010	<0.010	<0.005	0.01	

Downgradient of Landfill		As	Se	Hg	Ba	Cd	Cr	Pb	Ag
Monitoring Well	Sampling Date								
L-2	7/89	<0.005	<0.005	<0.0002	<0.1	<0.002	0.010	<0.005	<0.01
	7/90	<0.005	<0.01	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	9/91	<0.005	<0.005	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	7/92	<0.005	<0.005	<0.0005	<0.10	<0.005	<0.01	<0.005	<0.01
	5/93	<0.010	<0.005	<0.0002	1.4	<0.01	0.87	0.013	<0.01
	11/93	<0.010	<0.005	<0.0002	<0.20	<0.005	0.01	<0.003	<0.01
	6/94	0.081	<0.005	<0.0002	1.2	<0.005	0.99	0.037	<0.010
	12/94	<0.002	<0.002	<0.0002	0.0141	<0.001	0.0028	0.0011	<0.001
	5/95	<0.005	<0.005	<0.0002	0.067	<0.010	<0.010	0.01	<0.005
	12/95	<0.005	<0.005	<0.0002	0.06	<0.010	0.03	<0.005	<0.005
5/96	<0.005	<0.005	<0.0002	0.012	<0.010	<0.010	<0.005	<0.010	
L-3	7/89	0.005	<0.005	<0.0002	<0.1	<0.002	0.019	<0.005	<0.01
	7/90	<0.005	<0.01	<0.0005	<0.10	<0.01	<0.03	0.005	<0.05
	9/91	<0.005	<0.005	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	7/92	<0.005	<0.005	<0.0005	<0.10	<0.005	<0.01	0.012	<0.01

Table 2 (cont.)

Monitoring Well	Sampling Date	As	Se	Hg	Ba	Cd	Cr	Pb	Ag
	5/93	<0.010	<0.005	<0.0002	<0.20	<0.005	0.03	0.004	<0.01
	11/93	<0.01	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
L-3	6/94	<0.010	<0.005	<0.0002	0.011	<0.005	0.07	0.008	<0.010
	12/94	0.0057	<0.002	<0.0002	0.0205	<0.001	0.0069	<0.001	<0.001
	5/95	<0.005	<0.005	<0.0002	0.037	<0.010	<0.010	<0.005	<0.005
	12/95	<0.005	<0.005	<0.0002	0.02	<0.010	<0.010	<0.005	<0.005
	5/96	<0.005	<0.005	<0.0002	0.014	<0.010	<0.010	<0.005	<0.010
L-4	7/89	0.021	<0.005	<0.0002	<0.1	<0.002	0.048	0.005	<0.01
	7/90	<0.005	<0.01	<0.0005	<0.10	<0.01	<0.03	0.007	<0.05
	9/91	<0.005	<0.005	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	7/92	0.041	<0.005	<0.0005	<0.10	<0.005	0.11	0.007	<0.01
	5/93	0.012	<0.005	<0.0002	<0.20	<0.005	0.03	0.004	<0.01
	11/93	0.018	<0.005	<0.0002	<0.20	<0.005	0.03	<0.003	<0.01
	6/94	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.010	<0.003	<0.010
	12/94	0.0022	<0.002	<0.0002	0.0249	<0.001	0.0021	<0.001	<0.001
	5/95	<0.005	<0.005	<0.0002	0.025	<0.010	<0.010	<0.005	<0.005
	12/95	0.009	<0.005	<0.0002	0.03	<0.010	<0.010	<0.005	<0.005
	52/96	<0.005	<0.005	<0.0002	0.012	<0.010	<0.010	<0.005	<0.010
L-5	7/89	0.007	<0.005	<0.0002	<0.1	<0.002	0.014	0.008	<0.01
	7/90	<0.005	<0.01	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	9/91	<0.005	<0.005	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	7/92	0.006	<0.005	<0.0005	<0.10	<0.005	0.01	<0.005	<0.01
	5/93	0.021	<0.005	<0.0002	<0.20	<0.005	0.10	0.03	<0.01
	11/93	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
	6/94	0.04	<0.005	<0.0002	<0.20	0.014	0.07	0.034	<0.010
	12/94	<0.002	<0.002	<0.0002	0.0548	<0.001	0.00	0.0012	<0.001
	5/95	<0.005	<0.005	<0.0002	0.074	<0.010	<0.010	0.28	0.005
	12/95	<0.005	<0.005	<0.0002	0.07	<0.010	<0.010	<0.005	0.086
	5/96	<0.005	<0.005	<0.0002	0.054	<0.010	<0.010	<0.005	<0.010

NCGW Standards (1)	0.05	0.01	0.0011	1.0	0.005	0.05	0.05	0.05	0.05
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(1) NC Groundwater Classifications and Standards 15 NCAC 2L, May 11, 1989.

Table 3
 Industrial Landfill Area: Groundwater
 Inorganic Analysis - Additional Parameters
 Concentrations in ppm (mg/l)

Upgradient of Landfill									
Monitoring Well	Sampling Date	Be	Li	F	Cl	Sulfate	pH	Specific Conductivity(2)	
L-1	7/89	<0.005	106.0	NA	NA	NA	7.6	4400	
	7/90	0.02	140.0	0.34	410	5000	4.79	8380	
	9/91	<0.01	180	0.4	410	2500	5.0	8400	
	7/92	0.006	120	0.4	470	4200	5.5	8690	
	5/93	0.03	180	0.3	460	4600	5.36	7380	
	11/93	0.006	210	0.4	470	5000	5.37	7370	
	6/94	0.013	220	0.4	460	4900	5.32	8400	
	12/94	0.0081	236	0.4	560	5400	5.28	8160	
	5/95	<0.010	229	0.53	470	7000	5	11680	
	12/95	<0.010	250	0.44	470	6400	5.16	9410	
5/96	<0.010	310	0.58	410	8300	5.25	8,190		

Downgradient of Landfill									
Monitoring Well	Sampling Date	Be	Li	F	Cl	Sulfate	pH	Specific Conductivity(2)	
L-2	7/89	<0.005	<5.0	NA	NA	NA	6.8	90	
	7/90	<0.01	<0.03	0.10	3.2	4.4	6.45	112	
	9/91	<0.01	<0.03	<0.1	3.6	5.1	6.9	115	
	7/92	<0.005	<0.03	<0.1	4.1	7.1	6.9	127	
	5/93	0.009	<1.0	<0.1	5.2	14	7.55	143	
	11/93	<0.005	<1.0	<0.1	5.5	11	6.78	135	
	6/94	0.008	<1.0	<0.10	5.9	14	6.45	118	
	12/94	<0.001	0.0	<0.1	6.6	15	6.67	120	
	5/95	<0.010	<0.02	<0.1	6.9	15	6.4	166	
	12/95	<0.010	<0.01	<0.1	8.2	13	6.1	134	
5/96	<0.010	<0.1	<0.2	7.0	18	5.79	139		
L-3	7/89	<0.005	<5.0	NA	NA	NA	7.6	70	
	7/90	<0.01	<0.03	0.15	3.6	11.0	8.21	195	
	9/91	<0.01	<0.03	0.1	5.1	16	8.6	220	
	7/92	<0.005	<0.03	0.1	5.1	14	8.1	235	
	5/93	<0.005	<1.0	0.1	6.1	18	7.22	247	
11/93	<0.005	<1.0	0.1	5.7	19	7.94	232		

Table 3 (cont.)

Monitoring Well	Sampling Date	Be	Li	F	Cl	Sulfate	pH	Specific Conductivity(2)
L-3	6/94	<0.005	<1.0	0.2	6.2	21	7.89	205
	12/94	<0.001	0.0086	0.1	7.1	24	6.93	215
	5/95	<0.010	<0.02	<0.1	7.4	18	7.8	299
	12/95	<0.010	<0.01	<0.1	7.2	26	7.71	230
	5/96	<0.010	<0.1	<0.2	7.3	27	6.90	230
L-4	7/89	<0.005	<5.0	NA	NA	NA	7.4	1100
	7/90	<0.01	0.05	0.10	79.0	660.0	6.45	1480
	9/91	<0.01	0.05	0.1	84	610	6.4	1720
	7/92	<0.005	0.18	0.1	120	960	8.6	2090
	5/93	<0.005	<1.0	0.1	78	600	6.80	1580
	11/93	<0.005	<1.0	0.1	110	870	6.43	1705
	6/94	<0.005	<1.0	0.1	130	990	6.04	1770
	12/94	<0.001	0.00676	<0.1	150	980	6.22	1858
	5/95	<0.010	0.23900	0.1	120	900	6.21	2630
	12/95	<0.010	0.10000	0.11	120	1100	6.34	1990
L-5	5/96	<0.010	0.1	<0.2	88	790	6.10	1730
	7/89	<0.005	<5.0	NA	NA	NA	7.8	160
	7/90	<0.01	<0.03	0.10	5.8	57.0	6.29	216
	9/91	<0.01	<0.03	0.1	5.9	44	6.3	253
	7/92	<0.005	<0.03	<0.1	7.6	82	7.5	338
	5/93	0.02	<1.0	0.1	5.3	47	7.24	254
	11/93	<0.005	<1.0	<0.1	6.9	81	6.31	327
	6/94	<0.005	<1.0	<0.10	7.6	86	6.09	306
	12/94	<0.001	0.0182	<0.1	7.0	99	6.05	305
	5/95	<0.010	<0.02	0.13	4.5	100	5.88	426
12/95	<0.010	0.0200	<0.1	7.5	120	5.85	364	
5/96	<0.010	<0.1	<0.2	5.6	140	4.76	353	
CGW Standards (1)		0.004(3)	NL	2.0	250	250	6.5 - 8.5	NL

NA = Not Analyzed

NL = Not Listed

(1) NC Groundwater Classifications and Standards 15 NCAC 2L, May 11, 1989.

(2) Specific Conductivity reported in µMhos

(3) Federal Primary Drinking Water Standard

Industrial Landfill Area: Surface Water
Inorganic Analysis - RCRA Metals

Concentrations in ppm (mg/l)

Upgradient of Landfill

Surface Water Station	Sampling Date	As	Se	Hg	Ba	Cd	Cr	Pb	Ag
SW-1	7/90	<0.005	<0.01	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	9/91	0.012	<0.005	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	7/92	0.011	<0.005	<0.0005	<0.10	<0.005	<0.01	<0.005	<0.01
	5/93	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.10	<0.003	<0.01
	11/93	<0.010	<0.005	<0.0002	<0.2	<0.005	<0.01	<0.005	<0.01
(SW-6)	6/94	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.010	<0.003	<0.010
	12/94	0.011	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
	5/95	0.045	<0.005	<0.0002	0.032	<0.010	<0.010	0.013	<0.005
	12/95	0.069	<0.005	<0.0002	0.02	0.01	<0.010	<0.005	<0.005
	5/96	0.008	<0.005	<0.0002	0.013	<0.010	<0.010	<0.005	<0.010

Downgradient of Landfill

Surface Water Station	Sampling Date	As	Se	Hg	Ba	Cd	Cr	Pb	Ag
SW-2	7/90	<0.005	<0.01	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	9/91	<0.005	<0.005	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	7/92	<0.005	<0.005	<0.0005	<0.10	<0.005	<0.01	<0.005	<0.01
	5/93	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
	11/93	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
(SW-7)	6/94	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.010	<0.003	<0.010
	5/95	<0.005	<0.005	<0.0002	0.051	<0.010	<0.010	<0.005	0.008
	5/95	<0.005	<0.005	<0.0002	0.051	<0.010	<0.010	<0.005	0.008
	12/95	<0.005	<0.005	0.0013	0.04	<0.010	<0.010	<0.005	<0.005
	5/96	<0.005	<0.005	<0.0002	0.026	<0.010	<0.010	<0.005	<0.010
SW-3	7/90	0.05	<0.01	0.0024	1.8	0.11	0.13	0.070	<0.05
	9/91	<0.005	<0.005	<0.0005	<0.10	<0.01	<0.03	<0.005	<0.05
	7/92	<0.005	<0.005	<0.0005	<0.10	<0.005	<0.01	<0.005	<0.01
	5/93	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
	11/93	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
(SW-8)	6/94	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.010	<0.003	<0.010
	12/94	<0.010	<0.005	<0.0002	<0.20	<0.005	<0.01	<0.003	<0.01
	5/95	<0.005	<0.005	<0.0002	0.054	<0.010	<0.010	<0.005	<0.005
	12/95	<0.005	<0.005	<0.0002	<0.02	<0.010	<0.010	<0.005	<0.005
	5/96	0.010	<0.005	0.0006	0.038	<0.010	<0.010	<0.005	<0.010

NCSW Standards (1)	0.05	0.01	0.0011	1.0	0.005	0.050	0.050	0.050	0.05
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(1) NC Surface Water Classifications and Standards 15 2L, May 11, 1989.

Industrial Landfill Area: Surface Water
Inorganic Analysis - Additional Parameters
Concentrations in ppm (mg/l)

Upgradient of Landfill

Surface Water Station	Sampling Date	Be	Li	F	Cl	Sulfate	pH	Specific Conductivity(2)
SW-1	7/90	<0.01	13	0.803	23	170	6.83	643
	9/91	<0.01	19	0.3	31	290	6.0	1031
	7/92	<0.005	17	0.2	33	500	7.4	1258
	5/93	<0.005	8.5	0.3	20	210	6.83	697
	11/93	<0.005	38	0.2	38	750	6.27	1710
	6/94	<0.005	13	0.8	5.1	310	6.97	826
(SW-6)	12/94	<0.005	39.0	0.2	40.0	750	6.2	1318
	5/95	<0.010	29.9	0.2	38.0	600	6.05	1949
	12/95	<0.010	34.0	0.13	31.0	650	6.16	1440
	5/96	<0.010	47	0.20	34	700	6.34	1310

Downgradient of Landfill

Surface Water Station	Sampling Date	Be	Li	F	Cl	Sulfate	pH	Specific Conductivity(2)
SW-2	7/90	<0.01	1.7	0.80	19	120	6.98	622
	9/91	<0.01	0.95	0.4	25	270	6.3	751
	7/92	<0.005	1.1	0.4	35	250	8.9	912
	5/93	<0.005	3.2	0.3	26	300	6.81	1060
	11/93	<0.005	2.3	0.2	29	210	7.4	883
	6/94	<0.005	<1.0	0.2	8.3	92	6.79	724
(SW-7)	12/94	<0.005	2	0.2	27	240	6.8	584
	5/95	<0.010	3.6	0.26	26	380	6.5	1050
	12/95	<0.010	3.5	0.3	19	260	6.89	897
	5/96	<0.010	4.0	0.47	21	360	6.59	864

Surface Water Station	Sampling Date	Be	Li	F	Cl	Sulfate	pH	Specific Conductivity(2)
SW-3	7/90	<0.08	2.3	0.70	25	320	7.21	897
	9/91	<0.01	0.61	0.6	10	620	6.3	1420
	7/92	<0.005	0.38	0.4	16	190	7.8	678
	5/93	<0.005	1.2	0.3	15	260	7.04	827
	11/93	<0.005	<1.0	0.3	24	280	6.99	1042
	6/94	<0.005	1.1	0.2	10	130	7.57	894
(SW-8)	12/94	<0.005	0.75	0.2	17	260	7.23	495
	5/95	<0.010	1	0.25	18	190	6.18	926
	12/95	<0.010	0.8	0.17	9.1	170	6.02	162
	5/96	<0.010	0.9	0.27	56	110	5.91	150

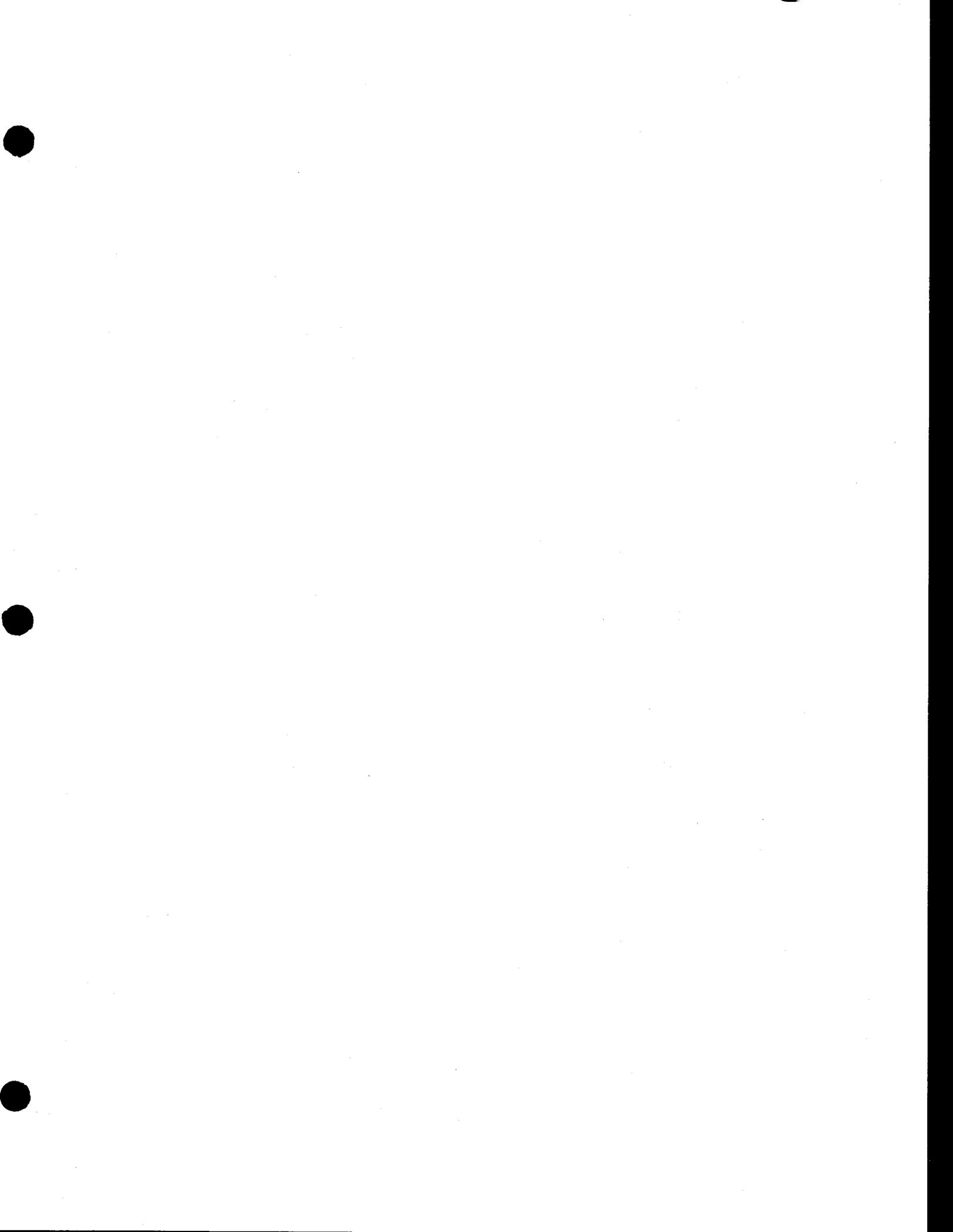
NCGW Standards (1)	0.004 (3)	NL	2.0	250	250	6.5 - 8.5	NL
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(1) NC Groundwater Classifications and Standards 15 NCAC 2L, May 11, 1989.
 (2) Specific Conductivity reported in µMhos
 (3) Federal Primary Drinking Water Standard

Table 6
 Industrial Landfill Area: Surface Water
 Summary of Volatile Organic Analyses*
 Concentrations in ppb (ug/l)

Sample Station	Sampling Date	Acetone	Benzene	Ethylbenzene
SW-1	5/93	<10	<5	<5
	11/93	<10	<5	<5
(SW-6)	6/94	<10	<5.0	<5.0
	12/94	NA	<5.0	<5.0
	5/95	<100	<5.0	<5.0
	12/95	<100	<5.0	<5.0
	5/96	<100	<5.0	<5.0
SW-2	5/93	32	5	11
	11/93	<10	<5	<5
(SW-7)	6/94	<10	<5.0	<5.0
	12/94	NA	<5.0	<5.0
	5/95	<100	<5.0	<5.0
	12/95	<100	<5.0	<5.0
	5/96	<100	<5.0	<5.0
SW-3	5/93	<10	<5	<5
	11/93	<10	<5	?
(SW-8)	6/94	<10	<5.0	<5.0
	12/94	NA	<5.0	<5.0
	5/95	<100	<5.0	<5.0
	12/95	<100	<5.0	<5.0
	5/96	<100	<5.0	<5.0

* No volatile organic compounds were detected using EPA Method SW-846 8240 in Surface Water samples SW1, SW2, and SW3 during the 7/90, 9/91 and 7/92 monitoring program. Quantitation limits were typically 5 ppb (ug/l).
 NA=Not analyzed



Preliminary Evaluation
FMC Corporation - Lithium Division
Bessemer City, North Carolina
Solid Waste Landfill
Permit No. 36-05
June 1996

ANALYSIS OF GROUNDWATER MONITORING RESULTS

MONITORING UNDER THE RCRA PROGRAM

Pursuant to the Corrective Action provisions of FMC's hazardous waste storage permit, a Facility Investigation was conducted in accordance with the work plan approved by the Division of Hazardous Waste Management. This Facility Investigation included "solid waste management units", or "SWMUs" for all waste (not just hazardous waste) units at the facility. During the facility investigation conducted pursuant to the hazardous waste permit requirements, the landfill area was reviewed and included in the SWMU list as SWMU No. 5, the "Industrial Landfill," referring to the areas of tailings and fly ash disposal, and as SWMU No. 12, the "Sanitary Landfill," referring to the areas of the landfill used for kiln scrubber solids and miscellaneous non-hazardous industrial wastes.

Attached are sections of the Facility Investigation report which concern SWUM No. 12 and SWMU No. 5. This report has been submitted to the Division of Hazardous Waste Management for review and approval.

FMC Corporation

Lithium Division
Highway 161
Box 795
Bessemer City North Carolina 28016
704 868 5300 Fax 704 868 5496

FMC

Certified Mail
Return Receipt Requested

September 29, 1995

Mr. Jimmy Carter, Chief
Hazardous Waste Section
North Carolina Department of
Environment, Health and Natural Resources
Division of Solid Waste Management
P.O. Box 27687
Raleigh, NC 27611-7687

Attn: Mr. Doug Roberts

Re: FMC Corporation - Lithium Division
Bessemer City, North Carolina
EPA ID Number NCD 000 771 964
RCRA Facility Investigation Report

Dear Mr. Carter:

In accordance with the provisions of Part V, Item D - RCRA Facility Investigation - in Hazardous Waste Management Permit No. NCD 000 771 964, FMC Corporation's Lithium Division facility in Bessemer City is herewith submitting two copies of the draft report on the RCRA Facility Investigation conducted at this facility pursuant to the subject permit.

If you have any questions, or require additional information, please contact Barbara Ritchie, FMC's Environmental Manager, at 704/868-0806.

Very truly yours,

Quentin G. Hopkins
Quentin G. Hopkins
Plant Manager

cc: Mr. G. Alan Farmer, Chief
RCRA Branch
Waste Management Division
U.S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, GA 30365
Attn: Mr. Channing Bennett, 4WD-RCRA-RPS-2
(Two copies of attached report)

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EXHIBIT I **BACK POCKET**

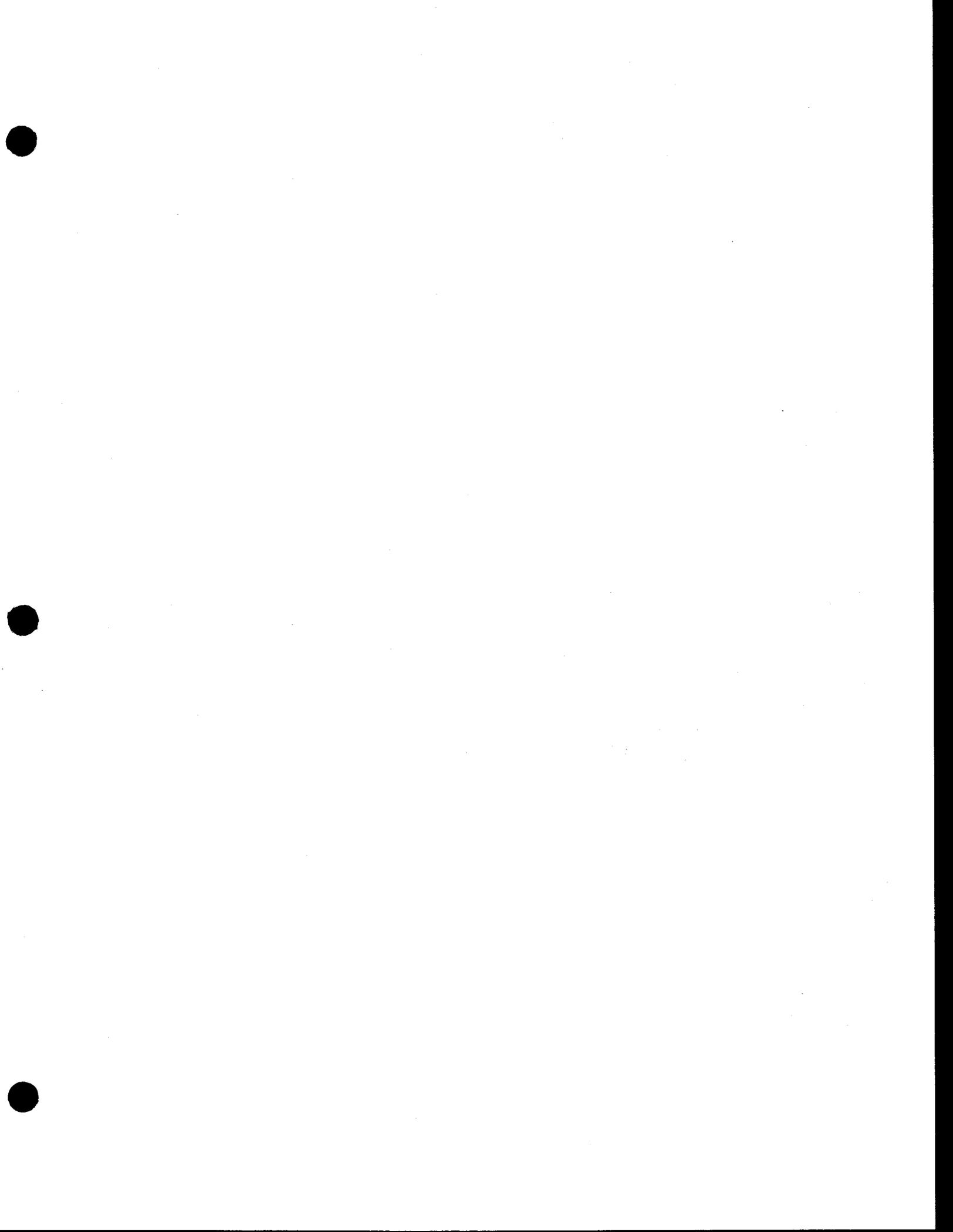
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EXECUTIVE SUMMARY

The general objectives of the FMC Corporation - Lithium Division, Bessemer City Manufacturing site (FMC) - RCRA Facility Investigation (RFI) are to characterize the site hydrogeology (principally the shallow groundwater system), to assess and identify any existing degradation to the site environmental media, to identify any potential releases from 15 Solid Waste Management Units (SWMUs), and to identify any potential hazards such releases may potentially have on human health. The Investigation was performed in response to a RCRA Section 3004(u) Corrective Action Permit (#NCD 000 771 964) issued by the U.S. Environmental Protection Agency (EPA) Region IV in conjunction with a Hazardous Waste Permit (#NCD 000 771 964) issued by the State of North Carolina. The RFI follows the specific task guidelines set forth in an approved Work Plan dated April 26, 1993, prepared by RUST Environment & Infrastructure (RUST E&I; formerly DUNN Corp.). RUST E&I initiated the Investigation in October, 1993 with all major field tasks completed by December 1994.

Analytical data collected during the Phase I RFI Investigation from on-site groundwater monitor wells indicate that some volatile organics, metals, and inorganics have been detected above drinking water standards. Subsurface soil samples, and water and sediment samples collected in site drainage features show little or no impact.

The Bermet Waste Site (SWMU 4) appears to be the principal source for PCE, TCE and DCE found in on-site media. Lesser concentrations of these same volatile organics can be found associated with the Southern Bessemer City Landfill (SWMU 7), and the Industrial Landfill (SWMU 5) in the vicinity of the Miscellaneous Operations Landfill and Gaston County School Burial site (SWMUs 8 and 14). Other volatile organics (1,1,1-trichloroethane and 1,2-dichloroethane) have also been detected in monitor points associated with the Southern Bessemer City Landfill (SWMU 7) which have not been detected elsewhere on FMC's property.

Soil analytical data collected during the Phase I RFI Investigation were compared to site background and risk-based criteria for worker ingestion or worker inhalation. Groundwater data were compared to site background groundwater quality, North Carolina Class GA groundwater standards, and U.S. EPA Maximum Contaminant Levels. Process water/wastewater results were characterized only. Drainage water/sediment data were compared to risk-based criteria-dermal contact for water, and incidental ingestion for sediment.

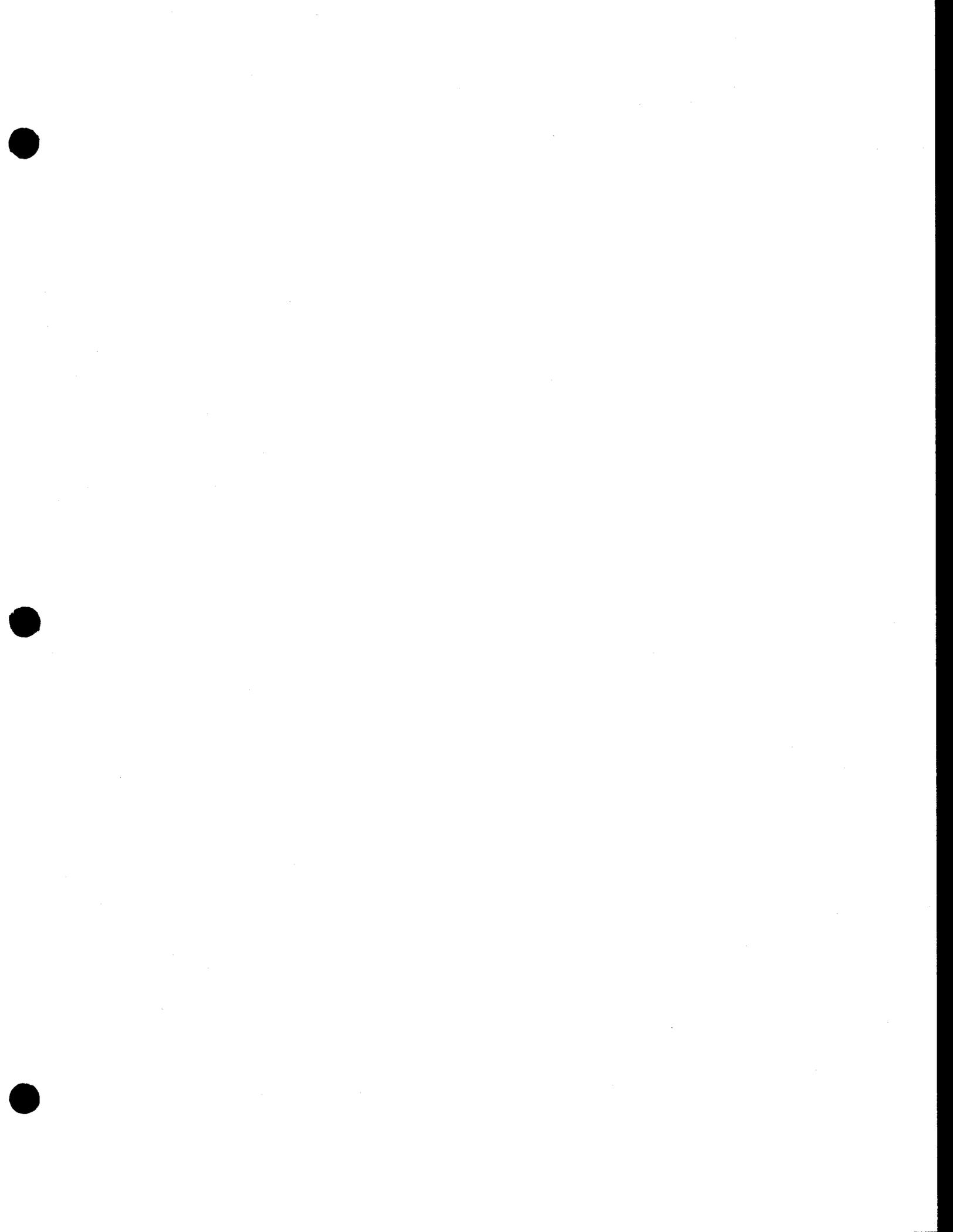
Based on the screening comparisons above, eight of the fifteen SWMUs are recommended for no further action. These include :

- SWMU 1 Kiln Particulate Scrubber
- SWMU 2 Butyllithium Spill Impoundment
- SWMU 9 Northern Bessemer City Landfill
- SWMU 10 Lithene Resin Disposal Area
- SWMU 11 Research and Development Lake
- SWMU 13 Old Bermet Sump
- SWMU 14 Gaston County School Burial Site
- SWMU 15 Bermet Bag-Filter House

Another SWMU (No.3-Sulfuric Acid Discharge Pipe) is recommended for no further action since the pipe is no longer active and poses no environmental concern. No samples associated with this SWMU were collected during the RFI Investigation.

The remaining SWMUs are recommended for further action based on analytical results, which indicated site-specific parameters that exceeded background concentrations and risk-based screening criteria. These include:

- SWMU 4 Bermet Waste Site
- SWMU 5 Industrial Landfill
- SWMU 6 Kiln Scrubber Ponds
- SWMU 7 Southern Bessemer City Landfill
- SWMU 8 Miscellaneous Operations Landfill
- SWMU 12 Sanitary Landfill



Therefore, the results of this and any other soil gas survey should only be used as an indication of a potential source of volatile organics. The type, extent and relative concentration of contamination that may or may not be present at a site should be confirmed using other investigative procedures.

6.4.1.5 Summary-SWMU 4 Bermet Waste Site

Groundwater analytical results indicate that groundwater downgradient of the Bermet Waste Site has been impacted by volatile organics, primarily PCE, TCE, 1,2-DCE and EDB. Elevated concentrations of PCE, TCE, EDB and 1,2-DCE were detected in both overburden and bedrock monitor wells. These results are consistent with the historic data from previous investigations that are included in Appendix A. Sulfate was also detected at elevated concentrations in groundwater monitor wells located both up and downgradient of the Bermet Waste Site. With the exception of the detection of selenium in one of the four groundwater samples from W-2, metals have not been detected above screening criteria values.

The SW-12 data indicated that the Drainage Channel water quality in the Eastern Drainage Channel has not been significantly impacted with respect to volatile organics, metals or anions for which analyses were performed. Low concentrations of PCE, acrolein, 1,2-DCE and lead were detected. No chemical concentrations exceeded dermal RBC concentrations.

The September 1994 sediment data indicate that the sediment quality in the Eastern Surface Drainage Channel has not been impacted with respect to on-site worker exposure. No chemical concentrations exceeded ingestion RBC concentrations.

The data indicate that further action and/or corrective measures may be warranted.

6.4.2 SWMUs 5, and 12: Industrial Landfill and Sanitary Landfill

Groundwater samples from seven monitor wells (L-1, L-2, L-3, L-4, L-5, DC-5 and DC-6) were collected as part of the evaluation of potential environmental impacts related to SWMUs 5 and 12. Two Western Drainage Channel water and sediment samples (SW/SED-7, SW/SED-8) were collected as part of the investigation of SWMUs 5, and 12. Therefore the discussion of the analytical results associated with these groundwater, surface water and sediment analytical results applies to these two SWMUs.

SWMU 5 is an unlined industrial waste landfill located in the southern section of Area II, just east of the Western Drainage Channel. Other areas identified as SWMU 5 also exist adjacent to (north of) SWMU 4 (Bermet Waste Site), west of SWMU 6 (Kiln Scrubber Ponds) and west of SWMU 7 (Bessemer City Landfill). Industrial wastes were also disposed of in the areas of SWMU 8, SWMU 10, SWMU 12 and SWMU 14, and in the north-central section of Area III. The wastes associated with the industrial landfill are ore residues and tailings and coal ash.

SWMU 12 is a sanitary landfill located within the confines of SWMU 5 located in the southwestern section of Area II. Solid waste material including wood, paper, empty cartons, filter cakes and other industrial wastes associated with a variety of production processes were disposed of in this area. Analytical results for SWMUs 5 and 12 are summarized on Table 6-10 and presented on Figures 6-18 through 6-25.

6.4.2.1 Groundwater Analytical Results

Groundwater from monitor wells L-1, L-2, L-3, L-4, L-5, DC-5 and DC-6 were analyzed for volatile organics, the RCRA metals plus beryllium and lithium, and chloride, fluoride and sulfate. Samples were collected in March, June, September and December 1994.

Monitor wells L-1 and L-3 are screened across the saprolite-weathered rock/saprolite-soil interface. Wells L-2 and L-4 are screened in the saprolite-weathered rock. Wells DC-5, DC-6 and L-5 are screened in the saprolite soil.

Organics Analytical Results

Monitor well L-1 is located upgradient of SWMUs 5 and 12. Groundwater from monitor well L-1 exhibited concentrations of chloroform, bromoform and PCE that exceeded the Class GA groundwater standards (bromoform 0.19 ug/l; chloroform 0.19 ug/l; PCE 0.7 ug/l).

The L-1 bromoform concentrations ranged from 6-8 ug/l, the chloroform concentrations ranged from 24-42 ug/l and the PCE concentrations ranged from 34-160 ug/l. The source of the volatile organics in L-1 is not known.

Groundwater from monitor well L-4 exhibited concentrations of chloroform and PCE that exceeded the Class GA groundwater standards. Chloroform concentrations in L-4 ranged from 5-7 ug/l. PCE concentrations ranged from 110-140 ug/l.

Groundwater from monitor well DC-6 consistently exhibited detectable concentrations of 1,1,1-trichloroethane, 1,1-dichloroethane and trichlorofluoromethane. However, all concentrations were below the Class GA groundwater standards. The compound 1,2-dichloroethane (DCA) was detected above the laboratory PQL (5 ppb) in the June 1994 DC-6 groundwater sample at 12 ug/l, which exceeds the Class GA groundwater standard of 0.38 ug/l. Monitor well DC-6 is located between monitor wells L-1 and L-4. Groundwater apparently flows from L-1 toward DC-6 and L-4. The groundwater samples from DC-6 did not exhibit detectable concentrations of chloroform or PCE. Both these compounds were detected in the groundwater samples from L-1 and L-4. Monitor wells L-1 and L-4 are screened in saprolite-rock, whereas well DC-6 is screened in the overburden saprolite soil. Data indicate chloroform and PCE are present at depth in the saprolite-rock and not the overburden soil.

Groundwater from monitoring wells L-1 and DC-6 exhibited acrolein concentrations that exceeded the groundwater RBC concentration (0.0556 ug/l). The L-1 and DC-6 acrolein concentrations were 8 ug/l. Considering that acrolein was detected in the L-1 monitoring well which is located upgradient of SWMU 5, consistent with the distribution of other organic compounds as described above, the data indicate that SWMU 5 is not the source of the acrolein detected in the L-1 and DC-6 groundwater samples.

No volatile organic compounds were detected at or above the laboratory reporting limit in the groundwater samples from monitor wells L-2, L-3 or DC-5.

Metals Analytical Results

The DC-6 September and December 1994 filtered arsenic concentrations, 254 ug/l and 148 ug/l, respectively, exceeded the Class GA groundwater standard of 50 ug/l. The DC-6 September and December 1994 arsenic concentrations were also elevated with respect to the site background W-7 concentrations and the SWMU upgradient L-1 groundwater concentrations. The March and June 1994 field filtered DC-6 arsenic values did not exceed the Class GA groundwater standard. The September 1994 DC-6 filtered lead concentration (21.2 ug/l) exceeded the Class GA groundwater standard of 15 ug/l and was also elevated with respect to the site background W-7 concentrations and the SWMU 5 upgradient L-1 groundwater concentrations.

Groundwater from monitor well L-1 exhibited field filtered lithium concentrations (field filtered 220-258 mg/l) that were considerably higher than the concentrations detected in groundwater samples from background well W-7 (field filtered <0.001-0.032). Monitor well L-1 is located upgradient of SWMU 5, indicating a lithium source upgradient of the industrial waste landfill. Lithium concentrations in groundwater monitor wells located downgradient of SWMU 5 were considerably lower than the L-1 groundwater concentrations. Groundwater lithium concentrations in monitor well L-4 ranged from 0.0676 mg/l to 0.29 mg/l, which are three orders of magnitude lower than the L-1 concentrations. However, the L-4 concentrations are still slightly elevated with respect to the W-7 background groundwater lithium concentrations (<0.001-0.032). Groundwater from monitoring well L-1 exhibited filtered beryllium concentrations that exceeded the NC groundwater standard of 0.004 mg/l. However, well L-1 is upgradient of SWMU-5 indicating an upgradient source.

Metals data indicate that with the potential exception of arsenic and lead, that SWMU-5 has not had an impact on groundwater quality with respect to metals. The lithium and beryllium concentrations reported in groundwater from L-1 and to a significantly lesser extent the lithium in L-4 are most likely not related to SWMU 5.

Inorganic Anions Analytical Results

Groundwater samples were analyzed for three inorganic anions, chloride, fluoride and sulfate. All groundwater fluoride concentrations were below the Class GA groundwater standard of 2 mg/l. Analytical results indicated that groundwater from monitor wells DC-6 and L-1 exhibited chloride concentrations that were elevated with respect to the Class GA groundwater standard of 250 mg/l. The DC-6 concentrations ranged from 240 mg/l to 420 mg/l. The L-1 chloride concentrations ranged from 490 mg/l to 560 mg/l.

Groundwater from monitor wells DC-5, DC-6, L-1 and L-4 exhibited sulfate concentrations that exceeded the Class GA groundwater standard of 250 mg/l. Sulfate concentrations in L-1 ranged from 4,900-6,800 mg/l, in L-4 700-990 mg/l, in DC-5 1,500-2,900 mg/l and in DC-6 490-6,400 mg/l.

Since monitoring well L-1 is located upgradient of SWMU-5 and exhibits elevated sulfate and chloride levels, the elevated sulfate levels reported in groundwater from monitoring wells DC-5, L-4 and DC-6 and chloride concentrations detected in groundwater samples from DC-6 are most likely not related to SWMU-5.

6.4.2.2 Drainage Channel Water Analytical Results

Two Drainage Channel water samples, SW-7 and SW-8, were collected from the Western Drainage Channel located to the west and southwest of SWMUs 5, and 12. Sample SW-7 was collected near the head of the Western Drainage Channel and SW-8 was collected approximately 900 feet downstream.

Organics Analytical Results

Drainage Channel water samples from location SW-7 were collected and analyzed for volatile organics in March 1994 and September 1994. A Drainage Channel water sample at location SW-8 was collected and analyzed for volatile organics in March 1994. Station SW-8 was not sampled in September due to dry conditions.

The volatile organic analytical results indicated that no volatile organic compounds were detected in the SW-7 and SW-8 samples at or above the laboratory PQL. Data indicate that Drainage Channel water quality in the Western Drainage Channel had not been impacted with respect to volatile organic compounds.

Metals Analytical Results

In March 1994 samples from locations SW-7 and SW-8, and in September 1994 a sample from location SW-7, were collected and analyzed for the RCRA metals, plus beryllium and lithium. Although the NC Class C surface water standards are not applicable to the Drainage Channels, results indicated that no metal analytes were detected above the Class C surface water standard. Most analytes were not detected at or above the laboratory PQL in either the SW-7 or SW-8 samples.

Data indicate that SWMUs 5, and 12 have not had a significant impact on Drainage Channel water quality in the Western Drainage Channel with respect to metals. All SW-7 and SW-8 metal concentrations were less than the dermal RBC concentrations.

Inorganic Anions Analytical Results

Drainage Channel water samples from location SW-7 were collected and analyzed for chloride, fluoride and sulfate in March and September 1994. A sample from location SW-8 was collected and analyzed for chloride, fluoride and sulfate in March 1994.

Although the NC Class C surface water standards are not applicable to the Drainage Channel, the SW-7 and SW-8 chloride and fluoride concentrations were less than NCDEHNR Class C surface water standards. The SW-7 and SW-8 fluoride and sulfate concentrations were less than dermal RBC concentrations. Data indicate that SWMUs 5 and 12 had not impacted Drainage Channel water quality with respect to on-site worker exposure.

6.4.2.3 Sediment Analytical Results

Two sediment samples were collected from the Western Drainage Channel. Samples SED-7 and SED-8 were collected at the corresponding water sample locations. The sediment samples were analyzed for the same parameters and at the same frequency as the corresponding water samples.

Organics Analytical Results

Volatile organic analytical results revealed that with the exception of acrolein (5.6 ug/kg) and acrylonitrile (11 ug/kg) in the SED-7 sample, no volatile organic compounds were detected at or above the PQL in either of the SED-7 samples or the one SED-8 sample. The SED-7 acrolein and acrylonitrile concentrations were less than the ingestion RBC concentrations. Data indicate SWMU 5 and SWMU 12 have not impacted sediments in the Western Drainage Channel.

Metals Analytical Results

None of the metals were detected in the SED-7 and SED-8 sediment samples were elevated with respect to the ingestion RBC concentrations. Data indicate that SWMU 5 and SWMU 12 have not impacted the Western Drainage Channel sediment metal concentrations with respect to on-site worker exposure.

Inorganic Anions Analytical Results

The fluoride and sulfate detected in the SED-7 and SED-8 sediment samples were not elevated with respect to the ingestion RBC concentrations. Data indicate that SWMU 5 and SWMU 12 have not impacted the Western Drainage Channel sediment inorganic anion concentrations with respect to one site worker exposure.

6.4.2.4 Summary- SWMUs 5 and 12; Industrial Landfill and Sanitary Landfill

Groundwater analytical data from wells associated with SWMUs 5 and 12 reveal that groundwater upgradient of the site (Monitor Well L-1) exhibited concentrations of chloride, sulfate, lithium, PCE, bromoform and chloroform that exceed groundwater standards. Monitor well L-4 exhibited concentrations of PCE and chloroform that exceeded groundwater standards. Both these wells are bedrock wells, and data indicate a source upgradient of SWMUs 5 and 12. The detection of these compounds in the L-1 sample, located upgradient of SWMU-5, indicate that levels of these constituents in downgradient wells are probably not related to SWMU-5.

DCA was detected in the June 1994 groundwater sample at a concentration which exceeds the Class GA groundwater standard of 0.38 ug/l. Groundwater from monitoring wells L-1 and DC-6 exhibited acrolein concentrations that exceeded the groundwater RBC concentration (0.0556 ug/l). The L-1 and DC-6 acrolein concentrations were 8 ug/l. Considering that acrolein was detected in the L-1 monitoring well which is located upgradient of SWMU 5, the data indicate that SWMU 5 is not the source of the acrolein detected in the L-1 and DC-6 groundwater samples.

With the exception of arsenic and lead in groundwater from DC-6, filtered metals analytical data indicate that groundwater downgradient of SWMUs 5 and 12 has not been impacted with respect to metals. The elevated lithium and beryllium reported in the L-1 filtered groundwater samples are not related to SWMU 5 or 12 and indicate a possible upgradient source. Inorganic analyses revealed that groundwater from DC-6 and L-1 exhibited chloride concentrations that exceeded the groundwater standard and wells DC-5, DC-6, L-1 and L-4 exhibited sulfate concentrations that exceeded the groundwater standard. The upgradient L-1 elevated sulfate concentrations indicate that the sulfate reported in the downgradient DC-5, DC-6 and L-4 wells is most likely not related to SWMU 5.

Drainage Channel water and sediment analytical results (SW-7/SED-7 and SW-8/SED-8) indicated that SWMUs 5 and 12 have not impacted Drainage Channel water and sediment quality with respect to on-site worker exposure. The SW-7/SED-7 and the SW-8/SED-8 chemical concentrations were less than the RBC concentrations.

Further investigation of groundwater is recommended.

6.4.3- SWMU 10: Lithene Resin Disposal Area

SWMU 10 consists of shallow trenches in which viscous polybutadiene was disposed. The polybutadiene finished product contained approximately 1 to 5 percent organic solvents (primarily toluene). SWMU 10 is located within the area of SWMU 5 in the southwestern section of Area II.

Six sub-surface soil samples were collected from two borings (three samples from each boring, SB-13 and SB-14) in the suspected vicinity of the lithene resin disposal area. The sub-surface soil samples from each boring were analyzed for volatile organics by USEPA Method 8010. With the exception of low toluene and xylene concentrations in two of the SB-13 sub-surface samples (SB-13, 1-3' and SB-13, 7-9'), no volatile organic compounds were detected. The reported toluene concentrations (4 to 7 ug/kg) and xylene concentrations (2 ug/kg) were less than the ingestion RBC concentrations. Data indicate that SWMU 10 has not impacted sub-surface soil with respect to volatile organics.

The groundwater and Drainage Channel water and sediment samples associated with SWMUs 5 and 12 may also apply to SWMU 10. The results from these samples were discussed in Section 6.4.2. The groundwater and Drainage Channel water and sediment samples indicate that SWMU 10 has not impacted groundwater quality, or the Drainage Channel water or sediments with respect to on-site worker exposure. Data indicate that no further action is recommended.

6.4.4 SWMU 6: Kiln Scrubber Ponds

SWMU 6 consists of two effluent ponds that receive process waters from the kiln scrubber unit. The ponds are unlined and each are approximately 1.1 acres in size.

Groundwater monitor wells DC-1 and DC-2 are located directly downgradient (hydraulically) of the ponds. Groundwater from monitor wells DC-1 and DC-2 were sampled in March, June, September and December 1994 and analyzed for volatile organics, the RCRA metals plus beryllium and lithium, and chloride fluoride and sulfate. Impoundment water and impoundment sediment samples were

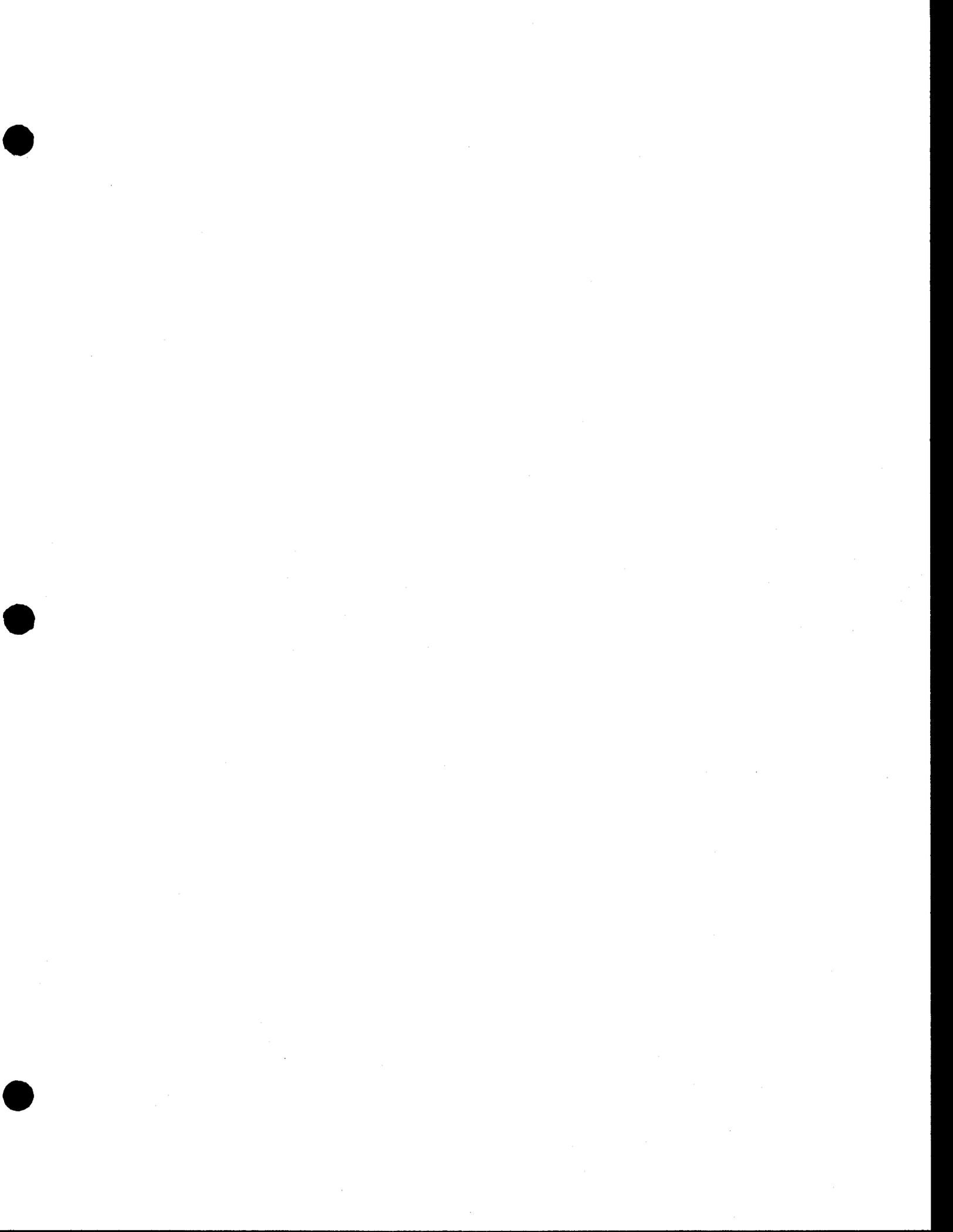
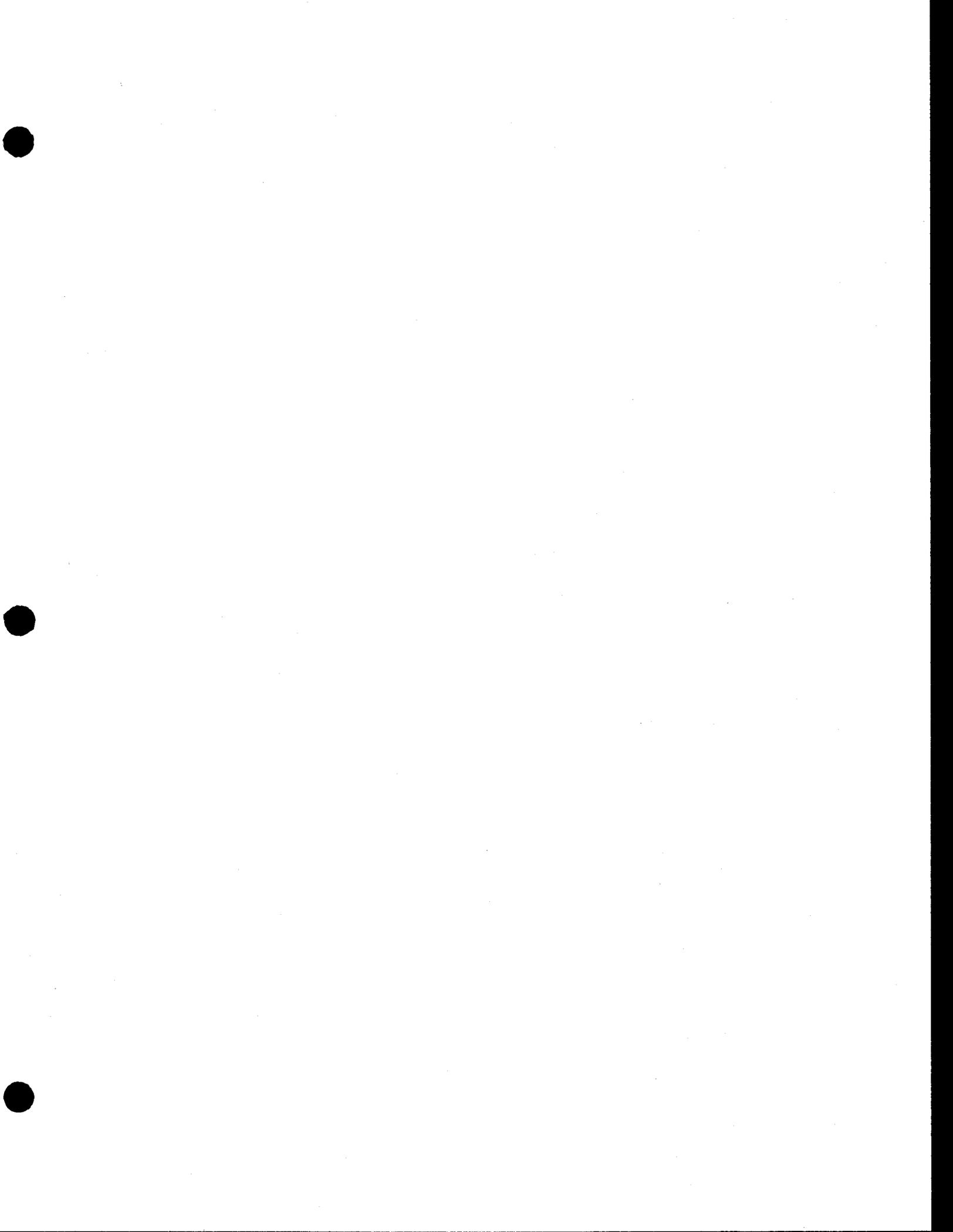


Table 6-10
Analytical Results
SWMUs 5, 10, 12

Parameter	Units	L-4			L-5			SW-7			SW-8			Units	SED-7	SED-8	SB-13:5-7	SB-13:7-9	SB-14:1-3	SB-14:7-9	SB-14:11-13	
		3/94	6/94	9/94	12/94	3/94	6/94	9/94	12/94	3/94	6/94	9/94	12/94									3/94
General/Inorganics																						
pH	SU	6.25	6.04	6.35	6.22	6.17	6.09	6.08	6.05	6.79	6.21	7.57		28.5	<28	86.4						
Specific Conductivity	µmhos	1736	1770	1805	1858	292	306	292	305	724	512	894		9.69	8	25.92						
Temperature	°C	15.8	16.2	15.5	15.6	16	16.8	16.1	16.6	9.9	20.2	8.4		475	<56	1998						
Turbidity	NTU		49.7	1.02	1.4	>1000	11.2	13.72														
TDS	mg/l	130	130	160	150	7.1	7.6	6.5	7	8.3	22	10										
Chloride	mg/l	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.2		9.69	8	25.92						
Cyanide	mg/l	960	990	700	980	98	86	65	99	72	75	130		475	<56	1998						
Fluoride	mg/l																					
Sulfate	mg/l																					
Sulfide	mg/l																					
Metals, Total																						
Antimony	mg/l	77	<10	2.3 B	2.2 B	48	40	<2	<2	<10	<2	<10		20900	19300 V	39420						
Arsenic	µg/l	<0.2	<0.2	0.0262 B	0.0249 B	<0.2	<0.2	0.0542 B	0.0548 B	<0.2	0.0466	<0.2 B		95	35 BV	194.4						
Barium	mg/l	<0.005	<0.005	<0.001	<0.001	0.01	0.014	<0.001	<0.001	<0.005	<0.001	<0.005		19	11.1 V	24.84						
Beryllium	mg/l	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.005		<0.95	0.23 BV	<2.7						
Cadmium	mg/l																					
Calcium	mg/l	0.16	<0.01	<0.001	0.0021 B	0.07	0.07	<0.001	0.0034 B	<0.01	<0.001	<0.01		34.2	18.1 V	54						
Chromium	mg/l																					
Cobalt	mg/l																					
Copper	mg/l	12	<3	<1	<1	38	34	<1	1.2 B	<3	1.2	<3 B		34200	20800 V	22140						
Lead	µg/l	0.29	0.073	0.0682 B	0.0676	0.093	0.086	0.0153 BV	0.0182 V	0.37	0.424	1.1 BV		703	348 V	648						
Lithium	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<100	<240 V	<100						
Mercury	µg/l	<5	<5	<2	<2	<5	<5	<2	<2	<5	<2	<5		<950	430 BV	<2700						
Nickel	µg/l	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.001	<0.01		<1.9	<0.21 V	<5.4						
Selenium	mg/l																					
Silver	mg/l																					
Thallium	mg/l																					
Tin	mg/l																					
Vanadium	mg/l																					
Zinc	mg/l																					
Metals, filtered																						
Antimony, filtered	mg/l	<10	<10	4.8 B	5.3 B	<10	<10	3.1 B	3.1 B	<10	<10	3.1 B										
Arsenic, filtered	µg/l	<0.2	<0.2	0.0253 B	0.0258 B	<0.2	<0.2	0.0553 B	0.0574 B	<0.2	<0.2	<0.2 B										
Barium, filtered	mg/l	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.005										
Beryllium, filtered	mg/l	<0.005	<0.005	<0.001	<0.001	<0.005	<0.005	<0.001	<0.001	<0.005	<0.001	<0.005										
Cadmium, filtered	mg/l	<0.01	<0.01	<0.001	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.001	<0.001										
Chromium, filtered	mg/l																					
Cobalt, filtered	mg/l																					
Copper, filtered	mg/l	<3	<3	<1	<1	<3	<3	1 B	1 B	<3	<3	<1										
Lead, filtered	µg/l	0.071	0.072	0.0674 B	0.078	0.017	0.019	0.0183 BV	0.0189 V	0.017	0.019	0.0183 BV										
Lithium, filtered	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2										
Mercury, filtered	µg/l																					



7.0 CONCLUSIONS

The RFI investigation at FMC's Bessemer City (Lithium Division) facility resulted in the following conclusions based on the technical evaluation of data generated or obtained as part of this investigation:

General

- Water table conditions exist beneath the FMC site. The water table is generally shallow, usually less than 45 feet below the land surface. Depending upon the location, the water table aquifer includes the ore tailings, saprolite soils and weathered bedrock beneath the site.
- Groundwater flow throughout the site area is generally closely related to existing site topography with the highlands serving as principal recharge areas and lowlands serving as discharge areas into the existing surface water courses.
- Seasonally, water table fluctuation determines the recharge/discharge characteristics of the Eastern and Western Drainage Channels. The upper reaches of the drainage system exhibit groundwater recharge (i.e. losing stream) characteristics while during normal and high flow conditions, these same features exhibit groundwater discharge (i.e. gaining streams) characteristics.
- Generally, the on-site drainage features represent localized groundwater discharge zones but only for the shallower portions of the aquifer. Deeper groundwater flow within the aquifer is expected to follow the regional flow patterns to the south-southeast towards Abernethy Creek and its tributaries.
- Based on the calculated hydraulic gradients for the site and the results of on-site hydraulic conductivity testing, preliminary average ground water velocities are estimated to be 0.64 feet/day for the ore tailings, 0.17 feet/day for the saprolite soils, and 2.4 feet/day for the weathered bedrock.
- Bessemer City residents and FMC receive their potable water from surface water sources remote and upgradient from the town and plant area, north-northeast of the site. A limited number of residential/commercial groundwater wells border the FMC property along Highway 161 to the west, Payne Road to the south, and Crowders Mountain Road to the east. Available data suggest that due to their topographic locations, interpreted groundwater flow patterns, and limited expected drawdowns, these supplies are considered outside the influence of groundwater flow from the FMC site.
- Based on elevated turbidity in unfiltered groundwater samples, field-filtered samples are considered most representative with respect to metals concentrations.
- Analytical data for the sampled media indicate sporadic detection of acrolein. The source has not been determined.

The following conclusions are presented on a SWMU-by-SWMU basis. Recommendations for further action with respect to each SWMU are summarized in Table 7-1, which is found at the end of this section.

SWMU 1-Kiln Particulate Scrubber

- Soil analytical data indicate no chemical concentrations above both background (BG) and risk-based criteria (RBC) concentrations.
- This SWMU is recommended for no further action.

SWMU 2-Butyllithium Spill Impoundment

- Water and sediment analytical data from the unlined impoundment indicate no chemical concentrations above both BG and RBC concentrations.
- This SWMU is recommended for no further action.

SWMU 3-Sulfuric Acid Discharge Pipe

- There is no documentation that indicates a release to the environment has occurred from the operation of this unit. The sulfuric acid drain line has been removed, and the SWMU does not represent an environmental concern.
- This SWMU is recommended for no further action.

SWMU 4-Bermet Waste Site

- Groundwater analytical data indicate that volatile organics, selenium, and sulfate concentrations exceeded BG and RBC concentrations downgradient of the Bermet Waste Site.
- Drainage water and sediment analytical data indicate no chemical concentrations that exceeded BG and RBC concentrations.
- This unit, generally, has been characterized, but may require further action/corrective measures.

SWMU 5-Industrial Landfill

- Groundwater analytical data indicate volatile organics, metals, and inorganics concentrations that exceeded BG and RBC concentrations.
- Drainage water and sediment analytical data indicate no chemical concentrations that exceeded BG and RBC concentrations.

- This SWMU may require further action.

SWMU 6-Kiln Scrubber Ponds

- Groundwater analytical data indicate that metals, sulfate, and acrolein, concentrations exceeded BG and RBC concentrations.
- This SWMU may require further action.

SWMU 7-Southern Bessemer City Landfill

- Groundwater analytical data indicate volatile organics concentrations that exceeded BG and RBC concentrations.
- Drainage water analytical data indicate acrolein and beryllium concentrations that exceeded BG and RBC concentrations.
- Sediment analytical data indicate no chemical concentrations that exceeded BG and RBC concentrations.
- This SWMU may require further action.

SWMU 8-Miscellaneous Operations Landfill

- Groundwater analytical data indicate that metals and inorganics concentrations exceeded BG and RBC concentrations.
- Drainage water analytical data indicate that beryllium concentrations exceeded BG and RBC concentrations.
- Sediment analytical data indicate no chemical concentrations that exceeded BG and RBC concentrations.
- This SWMU may require further action.

SWMU 9-Northern Bessemer City Landfill

- Soil analytical data indicate no chemical concentrations above BG and RBC concentrations.
- Groundwater analytical data indicate that chloroform and sulfate concentrations exceeded BG and RBC concentrations. Sulfate is believed associated with SWMU 5.
- This SWMU is recommended for no further action.

SWMU 10-Lithene Resin Disposal Area

- Soil analytical data indicate no chemical concentrations above BG and RBC concentrations.
- This SWMU is recommended for no further action.

SWMU 11-R&D Lake

- Groundwater, and drainage water and sediment analytical data indicate no chemical concentrations that exceeded BG and RBC.
- This SWMU is recommended for no further action.

SWMU 12-Sanitary Landfill

- Groundwater analytical data indicate volatile organics, metals, and sulfate concentrations that exceeded BG and RBC concentrations.
- Drainage water and sediment analytical data indicate no chemical concentrations that exceeded BG and RBC concentrations.
- This SWMU may require further action.

SWMU 13-Old Bermet Sump

- Soil analytical data indicate no chemical concentrations above BG and RBC concentrations.
- This SWMU is recommended for no further action.

SWMU 14-Gaston County School Burial Site

- Groundwater analytical data indicate that volatile organics and sulfate concentrations exceeded BG and RBC concentrations.
- Individually, this SWMU is recommended for no further action. Any future monitoring of this SWMU, however, would be achieved through further action recommended for SWMUs 5 and 8, within which SWMU 14 is contained.

SWMU 15-Bermet Bag-Filter House

- Soil analytical data indicate no chemical concentrations above BG and RBC concentrations.
- This SWMU is recommended for no further action.

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COMPLIANCE PLAN

As discussed earlier, FMC operates an onsite landfill so as to provide for the disposition of mineral extraction wastes, primarily tailings. These tailings result from the extraction of lithium from locally mined spodumene. However, the local source of spodumene, FMC's mine near Cherryville, North Carolina, is nearing the end of its useful life and FMC has identified a new lithium resource in South America. FMC is currently constructing a new facility in Argentina which will extract lithium from a brine resource using newly developed proprietary technology.

The Argentina facility will extract the lithium and manufacture lithium chloride and/or lithium carbonate. These lithium products will be shipped to Bessemer City for further processing, beginning as soon as late 1996. With the Bessemer City plant's lithium resource shifting to refined lithium chemicals (which Bessemer City will continue to be processed further into more refined lithium chemicals) the plant will cease to generate mineral processing wastes and continued operation of an onsite landfill will no longer be justified.

The Argentina plant is scheduled to startup as early as late 1996. However, the period of "shake-down" associated with a startup of a new plant, especially one employing brand new technology in an extreme climate 14,000 feet above sea-level, can be variable. A firm date to have the Argentina plant running at capacity sufficient to completely cease operations of the mine and extraction circuits can not be forecast with certainty. While FMC will begin phasing out the generation of tailings and mineral extraction wastes in Bessemer City in late 1996 or early 1997, the completion of the phase out may or may not be accomplished by January 1, 1998.

It is FMC's intention to cease operation of the landfill as soon as possible and by January 1, 1998. However, startup of the Argentina plant may delay FMC's ability to cease operations completely by that date. FMC would like to meet with Division of Solid Waste Management to review alternative means of compliance with the requirements of 15A NCAC 13B.

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Lastly, with respect to groundwater conditions at the facility, FMC believes that the historic sluicing of tailings into large unlined surface impounds is the likely source of any impacts to groundwater; stacked tailing deposited on the sluiced tailings are not believed to have the impact associated with the historic practice. Nonetheless, separation of the sources of any impacts to groundwater is difficult if not impossible. Given the overlap of the tailings disposal areas, and the presence of various other waste management units, FMC believes that further investigation and any corrective measures required to protect public health and the environment is best administered through the provisions of the hazardous waste management permit. This permit identifies all solid waste management units and includes requirements for investigation and remediation. By examining the facility as a whole, the site conditions are best understood, minimizing both administrative overlap and duplication, as well as efforts to attempt to segregate the impact of various sources from each other which is of questionable value in determining facility wide impacts.