UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: AUG 8 1989

SUBJECT: Preliminary Assessment, Removal Site Evaluation, and Funding Authorization Request for a CERCLA Removal Action at the Virgin Island Chemical Company, Inc. Site, St. Croix, U.S. Virgin Islands - ACTION MEMORANDUM

FROM: Douglas R. Kodama, On-Scene Coordinator
Response and Prevention Branch

TO: William J. Muszynski, P.E.
Acting Regional Administrator

THRU: Stephen D. Luftig, Director
Emergency and Remedial Response Division

I. EXECUTIVE SUMMARY

On January 23, 1989, Mr. George Pavlou, Associate Director for Enforcement Programs, formally requested that the Response and Prevention Branch conduct a removal evaluation at the Virgin Island Chemical Company site in St. Croix, U.S. Virgin Islands. A preliminary assessment, site inspection and removal site evaluation were conducted on January 31 and February 1, 1989.

Unstable and reactive hazardous materials are present in a building and on the grounds at this inactive chemical plant. Unknown contaminants are migrating off-site into the adjacent soil and potentially the ground water. Hazardous substances present include chlorine and hydrogen chloride, both of which are contained in extremely deteriorated cylinders, sodium metal a water-reactive material posing a threat of fire and potassium cyanide. Other reactive materials include diisobutyl aluminum hydride (a pyrophoric liquid), phosphorus pentoxide, sodium borohydride, sodium hydride and ethyl ether (potentially shock-sensitive).

Five businesses are adjacent to the facility and the St. Croix Prison at Golden Grove is located approximately one-quarter mile downwind from the site. An air release or fire at this chemical plant could adversely affect the prison, businesses and area residents.

The proposed removal action will address all above ground containerized materials and is expected to take eight to ten months to complete. The estimated project ceiling is $1,840,000 of which $1,262,000 is for mitigation contracting.

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II. BACKGROUND

A. Site Setting/Description

The Virgin Island Chemical Company (VIChem) is located on Plot 13Q of Estate Bethlehem Middle Works off of the Melvin Evans Highway (Route 66) in St. Croix, U.S. Virgin Islands. Located on the south side of the island near the western end of St. Croix (Figure 1), the 3.5 acre site has a gently rolling topography ranging in elevation from 10 to 30 feet above sea level. The site is bordered on the north by an intermittent stream which originates on the north side of the island and discharges to the Caribbean Sea. Runoff from the site enters this unnamed intermittent stream.

The Caribbean climate is typical of the Neotropics. Temperatures vary from 70°-95° Fahrenheit with a relative humidity in excess of 60%. Winds are fairly constant at 10-20 miles per hour and are generally from the eastern quadrant as they pass over the Caribbean Sea. Seasonal rains in winter and summer are common. Hurricanes and tropical storms may occur at any time during the year, but are more likely during the summer and fall.

The surrounding area is predominantly commercial with five businesses adjacent to the site. Downwind, approximately one-quarter mile northwest of the site is the St. Croix Prison at Golden Grove (Figure 1). Several residences are located one-third mile north of the site at Upper Bethlehem and three-quarters of a mile northwest of the site at Golden Grove. South of the site (upwind) is one residence within one-tenth of a mile, a quarry, the Melvin Evans Highway and the Alexander Hamilton Airport.

The site property is currently owned by the Charles H. Steffey Holding Corporation. This landowner originally leased the land on a 30 year lease to Houston Chemical Industries on May 1, 1969. On March 20, 1972, Houston Chemical assigned the lease to Caribe Chemical Company, Inc. (subsequently known as Pierrel America, Inc.). On June 30, 1978, Pierrel America assigned the ground lease to Cooper Laboratories, Inc.. On July 21, 1978, Cooper Laboratories incorporated Island Chemical Company as its subsidiary to assume its production activities at the facility. On October 30, 1979, Cooper Laboratories assigned the lease to its subsidiary, Island Chemical Company. On November 1, 1979, Cooper Laboratories sold all of the stock of Island Chemical Company to the predecessor of Berlex Laboratories, Inc. (a subsidiary of Schering-Berlin Inc.). On September 14, 1984, Berlex sold Island Chemical Company assets and assigned the lease to Virgin Island Chemical Company (VIChem). VIChem is currently inactive and attempting to sell company assets and reassign the lease.

Prior to 1980, it is believed that the facility was used for the manufacture of pharmaceutical chemicals, primarily phenacetin, ethoxyquin and quinidine. Berlex reportedly used this facility to make quinidine gluconate used for the production of quinine. Quinine is an antimalarial medicine and flavoring in carbonated beverages. VIChem produced benzyl acetate by reacting benzyl chloride with acetic acid. Benzyl acetate is used in perfumes, flavorings, resins, lacquers, polishes, printing inks and varnish removers. In 1985, VIChem also began producing benzyl salicylate which is used as a perfume fixative, solvent for synthetic musk, sun-screening lotions and soap odorant.

In 1984, U.S. Resources and Chemicals, Inc. began leasing a portion of the facility from VIChem, and shortly thereafter started an alcohol dehydration operation. U.S. Resources transferred the lease and operation to VIAG Fuels, Inc. (VIAG). VIAG currently owns the alcohol dehydration process equipment and is presently inactive. According to David Weston, President of VIAG, there is an oral agreement between Chase Manhattan Bank (VIChem's mortgage bank), VIChem and VIAG in which VIAG currently provides site security. Also on-site at the present time is the St. Croix Security Kennels (SCSK). Dog kennels for 20 to 30 guard and attack dogs are present and the Secretary/Treasurer for SCSK lives on-site in a trailer.

B. Quantity and Types of Substances Present

The VIChem process facility was set up for batch and semi-continuous chemical manufacture. The process area, east of the maintenance and utility building (Figure 2) consists of two open-bay reactor areas and a centrifuge/dryer building. The six reactors are either glass-lined or stainless steel and are agitated, jacketed and have overhead condenser systems. Four of these reactors are also equipped with distillation columns. The centrifuge/dryer building contains various centrifuges, dryers, filters and grinding equipment. During the January 1989 preliminary assessment, inspection of accessible areas of the reactors and the centrifuge/dryer building revealed that they were empty of raw materials and product.

West of the main building is the tank farm which contains fourteen 8000 gallon tanks. Four of these tanks contain ethanol and one tank contains diesel fuel owned by VIAG and used to fuel their alcohol dehydration process. The remaining tanks in the tank farm are empty.

The main building and warehouse (areas 1,3,4,5 and 6 on Figure 3) contain approximately 400 drums (drum inventory, Table 2). Two hundred of these drums are labeled ethyl alcohol and half of these are empty. The condition of the ethyl alcohol drums varies from fairly sound to extremely deteriorated. Some of the other materials in the warehouse which are in deteriorated or leaking

containers include a cylinder of chlorine, one cylinder of hydrogen chloride, one unlabeled bulging drum, two drums with unknown contents in which a reaction has taken place causing the lids to come off and dispersing a white crystalline material, one drum of sulfamic acid which is broken and is leaking its contents.

The deterioration of these containers has been accelerated by leaks in the warehouse roof, causing portions of the warehouse floor to be flooded after it rains. The accumulation of rain water on the floor allows spilled materials to mix and is eventually discharged to the ground east of the warehouse near the septic tank.

The majority of the remaining drums contain flammable, poisonous, combustible or corrosive materials. Although some of these drums are in poor condition, they have not yet been severely impacted by rain water from the leaking roof.

The two laboratories within the main building (areas 11,15,18 and 22 on Figure 3) contain over 800 laboratory reagent containers (lab inventory, Table 1). Some of the more dangerous materials within the labs are: sodium metal (water-reactive), ethyl ether (formation of shock-sensitive peroxides), diisobutyl aluminum hydride (air-reactive), potassiun cyanide stored near acids (hydrogen cyanide air release), phosphorus pentoxide (water-reactive), sodium hydride (water-reactive), sodium borohydride (water-reactive), and approximately 75 unknown materials in reagent-size containers. At the time of EPA's removal site inspection on February 1, 1989, the water from the leaking warehouse roof had not affected the lab areas.

According to the June 1978 "Quinidine Sourcing Project" written for Cooper Laboratories and attached as Exhibit B to Civil Action No. 88-1346-Y "Certification of Michael C. Chester", both di-isobutyl aluminum hydride and sodium metal were necessary for converting cinchona bark into quinidine gluconate. According to Exhibit C of this document, Cooper Laboratories experimented with this process from November 1978 to October 1979.

Table 3 lists materials on-site which are CERCLA hazardous substances and the statutory source for this designation. Table 4 lists toxicological effects of some of the compounds found at the site.

C. National Priorities List Designation

This site is not on the National Priorities List. It has not been submitted for ranking.

III. THREAT

A. Threat of Exposure to the Public and the Environment

Five categories of threats exist at this site: threat of fire/ explosion, threat of direct contact, threat of an air release from the deteriorated hydrogen chloride and chlorine cylinders, the multiple threats posed by the leaking roof in the warehouse, and the improper storage of reactive hazardous materials at this inactive facility.

Neither of the two companies presently operating at the site (SCSK, VIAG) have qualified personnel to safely handle or monitor hazardous materials stored at the facility. The threat of exposure through direct contact, ingestion or inhalation exists for personnel employed by these companies. All personnel have free access to the labs and warehouse area. Tampering with some of the reactive materials or materials in deteriorated containers could result in serious injury or death.

Incompatible materials are stored in close proximity in the laboratories and the warehouse. In addition, the potential for adverse reactions is real and will continue to increase as the chemicals age in a hot and humid climate and are subject to persistent winds laden with saline moisture from the Caribbean Sea and rain water from the leaking warehouse roof. At least three examples of reactions taking place are evident in the drum storage area. These consist of one bulging drum and two drums in which an unknown crystalline material has exerted enough pressure to push open the drum lids and dispersed this material to the surrounding floor (photo #16). An unknown lab reagent has leaked its contents within one of the reagent storage closets (photo #10 and #11).

During a fire, explosion or air release from VIChem, nearby residences, businesses, the St. Croix prison and people using the Melvin Evans Highway could be severely impacted by toxic-laden smoke or plume. There are three fire departments on St. Croix which would respond to a fire at this facility. Although they have a number of self contained breathing apparatus, the required OSHA training is limited for qualified responders to hazardous material incidents.

In addition, there is another exposure pathway for direct contact and ingestion. Groundwater contamination by chloroform has been well documented by EPA for potable wells in the immediate vicinity of the VIChem facility. The March 13, 1986 RCRA Enforcement investigation, conducted by the Surveillance and Monitoring Branch, revealed chloroform contamination in the on-site production well. During March and November 1988, the Response and Prevention Branch conducted well sampling and

analyses at the nearby Fairplains wells. These wells are located between VIChem and the St. Croix prison and are a major source of drinking water on the island. Chloroform contamination was found in Fairplains wells number 6, 8 and 9 in concentrations ranging from 11 ug/l to 75 ug/l (ug/l=micrograms per liter). The Virgin Island Port Authority (VIPA) well number 2 is located approximately one-half mile west of the site and was also contaminated with chloroform at a concentration of 11 ug/l.

During the March 1986 RCRA Enforcement investigation, the inspectors observed four empty 55 gallon drums of chloroform. During the Response and Prevention Branch's site investigation in January 1989, one 55 gallon drum and one four liter bottle of chloroform were observed. There are no other known chemical industries in the Upper Bethlehem/Golden Grove area.

B. Evidence of Extent of Release

The warehouse area of the main building contains several drums which have leaked or are presently leaking. A 55 gallon fiber drum of sulfamic acid has been extremely deteriorated by the flooding of the warehouse floor from the leaking roof (photo #17). Two unlabeled drums show signs of an uncontrolled reaction and have dispersed some of their contents to the surrounding warehouse floor (photo #16). Bags of tartaric acid have deteriorated and released some of the acid to the floor as well (photo #21). Several unlabeled drums are in such poor condition that any material in them has already been released (photo #19). There may be other releases which have occurred which are not as obvious as those presented in the photodocumentation. Air monitoring in the warehouse area during the initial entry in January 1989 revealed minor elevated readings on the organic vapor analyzer (1 to 2 units above background). No other elevated air monitoring readings were observed.

Leaks in the warehouse roof have allowed for the mixing of spills in the warehouse and their subsequent release to the environment. As the rain water accumulates on the warehouse floor it eventually reaches a point where the water flows out of the east side of the warehouse (areas 2 and 4, Figure 3) and is discharged to the soil adjacent to this area of the warehouse.

Investigations conducted by the Surveillance and Monitoring Branch (SMB) in 1985 and 1986 revealed that process waste water from the facility was discharged into the intermittent stream adjacent to the site. Analyses of sediments from this creek bed downstream from the discharge point showed that contamination consisted of xylene, di-n-octyl phthalate, 1,4-dichlorobenzene, 1,2-dichlorobenzene, napthalene, fluorene, phenanthrene, aliphatic and aromatic hydrocarbons, arsenic, beryllium, chromium, copper, lead, nickel, antimony, and zinc. The on-site production well had detectable levels of arsenic, beryllium,

cadmium, chromium, copper, mercury, antimony, and zinc in addition to the previously mentioned chloroform contamination.

There are four possible sources for the contamination listed above. 1) A 17,000 gallon underground concrete pit used to contain production wastewater and sludges. This pit was abandoned and sealed with concrete in 1985. 2) The former wastewater drainage line leading from the process water pit to the intermittent stream was constructed of welded 55 gallon drums. This pipeline was excavated and replaced when it was discovered that numerous leaks and punctures had allowed wastewater to contaminate the surrounding soil. 3) Soil contamination as a result of leakage from a broken drainage line originating at a laboratory drain. 4) Spills associated with material transfer and tank or process line leakage.

C. Previous Actions to Abate Threat

As part of the sales contract with VIChem, Berlex (Island Chemical Company) was required to clean up any contamination present at the site. Berlex hired Enviro-Sciences, Inc. (ESI) of Denville, NJ, to survey the site and certify it as environmentally clean. ESI's sampling survey disclosed four areas of contamination. Two areas within the tank farm were found to be contaminated, primarily with toluene. This contamination was thought to be from process or transfer spills. The other two areas, underneath the concrete loading dock and a nearby trench were contaminated primarily with pyridine. This contamination is believed to be from the leaking laboratory drain. The quantity of contaminants was estimated at 125 pounds of toluene and 120 pounds of pyridine.

ESI recommended on-site treatment of the contaminated soil. The toluene contaminated soil was to be placed in a drying oven equipped with carbon filters, so that emission rates did not exceed the 200 ppm Threshold Limit Value (TLV) for toluene. The pyridine contaminated soil was to be treated by cutting the concrete pad and tilling the soil every two to three days and allowing the soil to aerate. A structure was to be built over the area to prevent soil saturation from rainfall.

During SMB's September 1986 investigation these two on-site treatment procedures were confirmed, however some discrepancies were noted from the process outlined above. The drying oven was employed for the volatilization of toluene from the soil, but the charcoal filters to absorb the volatilized material were not observed. The contaminated soil was tilled and aerated using a backhoe and then covered with a large synthetic liner. No permanent structure had been built to prevent future saturation of the soil from rainfall. The synthetic liner was not owned by Berlex but was rented. During RPB's January 1989 investigation

this area was covered by concrete and a new loading dock had been built. It is adjacent to the dog kennel area and trailer used for living quarters by the kennel operator.

In addition, on October 10, 1985, SMB was informed by Dr. A.L. Kyles, Vice President, Enviro-Sciences, that 192 55 gallon drums of waste were removed by Berlex for disposal. This material consisted of process pit water and sludge, drums and soil from the wastewater drainage line, one 55 gallon drum of water/toluene, and toluene contaminated soil. No copies of manifests were received to confirm these shipments. At the time (1985) an additional 33 drums of waste belonging to Berlex were staged on site awaiting sample analyses and disposal. Data on the sampling performed by Berlex was never received by SMB to confirm the clean up by Berlex. Also, the re-routing of existing laboratory discharges to a self-contained unit was not observed.

When Region II became aware of chloroform contamination in the public wells in St. Croix a health evaluation was conducted. According to the Agency for Toxic Substances and Disease Registry (ATSDR), chloroform is a B-2 carcinogen and has been shown to be a carcinogen in animals but not in humans. The Maximum Contaminant Level (MCL) for chloroform is 100 parts per billion (ppb). If other halogenated organics were present along with the chloroform, the 100 ppb MCL would be for all halogenated organics present. Chloroform contamination ranged from 11 to 75 ppb and no other contaminants were detected. Since the MCL was not exceeded, a CERCLA/SARA response was not initiated.

D. Current Actions to Abate Threat

The threat of direct contact to the general public is currently being limited by a perimeter chain link fence and site security maintained by VIAG and SCSK. There is evidence that at times the guard dogs are allowed to roam through the yard of the facility.

In a letter dated March 1, 1989, to Region II's New York/ Caribbean Compliance Branch, Fred Schubert, President of VIChem, informed EPA that during his February 21-23, 1989 site visit "a small amount of non-contaminated rain water was swept out of the warehouse floor, the floors of the warehouse were swept and all sweepings were collected in an open head drum which was covered and remains on the site and a single five gallon pail of a laboratory solvent was placed in a second open head drum which was covered and remains on the site". No sampling/analyses were conducted to verify if the rain water or floor sweepings were contaminated. The type of laboratory solvent overpacked is unknown. Mr. Schubert also stated "non-chemical waste (empty boxes, waste paper, etc.) was removed from the site". Cans of paint were staged in one location outdoors.

IV. ENFORCEMENT

Berlex Laboratories, Inc. has submitted a work plan to EPA for the performance of environmental sampling at the site. The work plan is being finalized, after which it is expected that Berlex will implement the work called for by the work plan, pursuant to an Administrative Order to be issued by EPA.

On March 13, 1989, Notice Letters were sent to the following Potentially Responsible Parties (PRPs): Berlex Laboratories, Inc., Island Chemical Company, Inc., CHS Holding Corporation, Virgin Island Chemical Company, and VIAG Fuels, Inc.. None of these PRPs indicated that they were willing to conduct or finance a drum removal or other appropriate CERCLA response.

VIChem has indicated that it would not object to or obstruct EPA's performance of the removal action described herein. EPA will also seek VIAG's and SCSK's agreement to not operate or have personnel (or dogs) on-site during working hours of the removal action or if conditions at the site (stability) warrant evacuating the site of non-essential personnel. It may be desirable to have SCSK maintain site security during interim periods when EPA has temporarily demobilized for analytical and transportation/disposal coordination. The dog kennel is a very effective deterrent for potential trespassers or vandals. Further, EPA will seek to ensure that VIAG properly removes its numerous paint cans and two drums of water treatment chemicals at the site.

Four of the tanks currently contain ethanol. VIAG does not own this ethanol; however, they intend to buy this material when their company becomes fully operational. Enforcement Programs will seek assurances from VIAG that VIAG intends to buy the ethanol from the current owner of this alcohol, Ethanol Corp. of Birmingham, Alabama, and that VIAG will take responsibility for this material by using and storing it properly. This action will generate a cost savings to the Region in that 40,000 gallons of product will not have to be disposed of or recycled by EPA. The tanks appear sound and should provide continued safe storage of the ethanol.

V. PROPOSED PROJECT AND COSTS

A. Objective of the Project

The overall objective of this removal action will be to reduce the threat of fire, explosion, air release and direct contact.

The scope of this response will be to continue site security, stabilize reactive, leaking or weakened containers, and dispose of above ground containerized materials and resample public wells contaminated with chloroform.

For the purposes of planning, this response will be divided into three phases. The first phase of the project will involve activities at the site which reduce the most immediate potential for fire/explosion or air release and stabilize leaking and weakened containers. A security service will be provided during those times of the removal action when work is not being performed at the site. The activities and actions of the first phase are listed below.

Phase 1:

1) Stabilize, detonate/treat, or recycle air-reactive, water-reactive and shock-sensitive materials, and the deteriorated cylinders.

2) Sample and overpack or transfer to new drums all other containerized materials.

3) Contact potential recyclers in the Caribbean area (USVI and Puerto Rico) and coordinate recycling of usable product if possible and appropriate. Recyclers outside the Caribbean area may not be considered. This is due to the possibility of a recycler rejecting a product. If this were to occur with a United States mainland recycler, the cost of transportation from and back to the site would far exceed any potential cost savings to be realized through recycling.

4) Segregate materials by hazard class, and separate incompatible materials. Relocate and stage all overpacked containers in an area of the warehouse where they will not be impacted by rain water from the leaking roof. If dry warehouse space is limited, overpacked drums will be placed on pallets and covered with waterproof tarps.

5) Conduct sampling of the Fairplains and VIPA wells and analyze for chloroform contamination.

EPA will not make capital improvements to the main building by repairing the leaking warehouse roof. All sound and usable tanks will be left on site. Except for the 40,000 gallons of ethyl alcohol discussed previously, the contents of other tanks will be disposed of.

Any on-site treatment or detonation (on- or off-site) will be fully coordinated with the St. Croix Local Emergency Planning Committee (LEPC) and U.S. Virgin Islands Emergency Response Commission (VIERC). If these commissions are not established or fully functional by this time, these actions will be coordinated with the Virgin Islands Department of Planning and Natural Resources (DPNR) and appropriate emergency management agencies.

Phase 2:

1) Continue recycling efforts.

2) Conduct verification analyses for known materials and waste characterization for unknown materials or labeled materials which may have been tampered with.

3) Conduct disposal analyses for bulked unknown samples.

4) Based on this analytical information, coordinate the transportation and off-site disposal of all remaining materials.

Phase 3:

1) Continue recycling efforts.

2) Package and label containers for transportation to the pre-arranged disposal facility.

3) Site demobilization and discontinue site security.

Use of disposal facilities in Puerto Rico will be considered. However, these facilities may not be in compliance with appropriate RCRA regulations.

Due to the fact that transportation for off-site disposal will be by water carrier, all drums leaving the site will be overpacked or in new drums. Materials will not be bulked in tanks or sealed roll-off containers in order to avert the possibility of an adverse reaction occurring during transportation. The increase in cost due to this action will outweigh the risks associated with a mode of transportation which will take a relatively long period of time during which mixing by wave action on the ship and heat from the tropical environment persists.

B. Project Estimated Costs

The following synopsis of the estimated costs is based on information obtained from several sources. The ERCS cost data is based on the OSC's copy of the ERCS contract. Several OSCs and OSC Reports were consulted for on-site treatment cost estimates and typical costs for field purchases, rental equipment and other items while working in the Caribbean.

This is the first drum removal conducted in the U.S. Virgin Islands by Region II. Delays from the weather (rain storms, heat stress), supply and equipment deliveries, and other logistical complications are expected. Consequently, the ERCS contingency factor has been increased to 30%.

O.H. Materials will be the ERCS contractor for this removal, since they are the only Region II ERCS contractor to service the Caribbean area.

REMOVAL PROJECT CEILING COSTS

EXTRAMURAL COSTS	
ERCS Cleanup Contractor	$971,000
30% Contingency Factor	$291,300
Rounded Mitigation Contracting Total	$1,262,000
TAT Costs	$105,000
Subtotal Extramural Costs	$1,367,000
20% Contingency of Extramural Costs	$273,400
Total Extramural Costs	$1,640,400
INTRAMURAL COSTS	
Direct Costs	$50,000
Indirect Costs	$150,000
TOTAL PROJECT CEILING	$1,840,400
ROUNDED TOTAL PROJECT CEILING	$1,840,000

C. Project Schedule

Approximately one month prior to the anticipated start date, the OSC and Response Manager from O. H. Materials will visit the site and review the scope of work, and develop strategies and a work plan. This will be necessary to determine which equipment and supplies will have to be shipped from the mainland.

Mobilization of equipment will take two weeks and mobilization of personnel will take two days. The first phase should take approximately three weeks. Analytical, transportation and disposal coordination will be the most time-consuming phase and may take six to eight months. After all disposal approvals have been obtained, the final phase for packaging, labeling and off-site shipment is anticipated to take three weeks.

All disposal activities will be conducted in accordance with CERCLA's off-site disposal policy and other applicable or relevant and appropriate regulations.

VI. RECOMMENDATIONS

Conditions at the VIChem site meet the criteria for a removal action under 40 CFR 300.65(b)(2) of the November 20, 1985 National Oil and Hazardous Substances Contingency Plan (NCP). These criteria are:

1) Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations, animals or food chain (Section 300.65(b)(2)(i));

2) Actual or potential contamination of drinking water supplies or sensitive ecosystems (Section 300.65(b)(2)(ii));

3) Hazardous substances or pollutants or contaminants in drums, barrels, tanks or other bulk storage containers, that may pose a threat of release (Section 300.65(b)(2)(iii));

4) Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released (Section 300.65(b)(2)(v));

5) Threat of fire or explosion (Section 300.65(b)(2)(vi));

A removal action addressing containerized surface contaminants, pollutants and hazardous substances is consistent with Section 104(b)(2) of CERCLA as amended by SARA, in that this response will contribute to the efficient performance of long term remedial actions planned for this site.

The funds requested to initiate and complete this removal action will come from the Removal Advice of Allowance for Fiscal Years 1989 and 1990. Obligation of the necessary funds to complete this removal will occur in the first quarter of FY 1990. This action is in accordance with OSWER Directives 9360.0-18 and 9200.3-05.

I, therefore, recommend your approval of this request for a removal action under CERCLA as amended by SARA for the Virgin Island Chemical Company site. The estimated project ceiling for this removal is $1,840,000 of which $1,262,000 is for mitigation contracting.

Your authority to approve these project funds is pursuant to Assistant Administrator J. Winston Porter's May 25, 1988, redelegation memorandum, Delegation Number R-14-1-A.

APPROVED: _____ DATE: 8/8/89

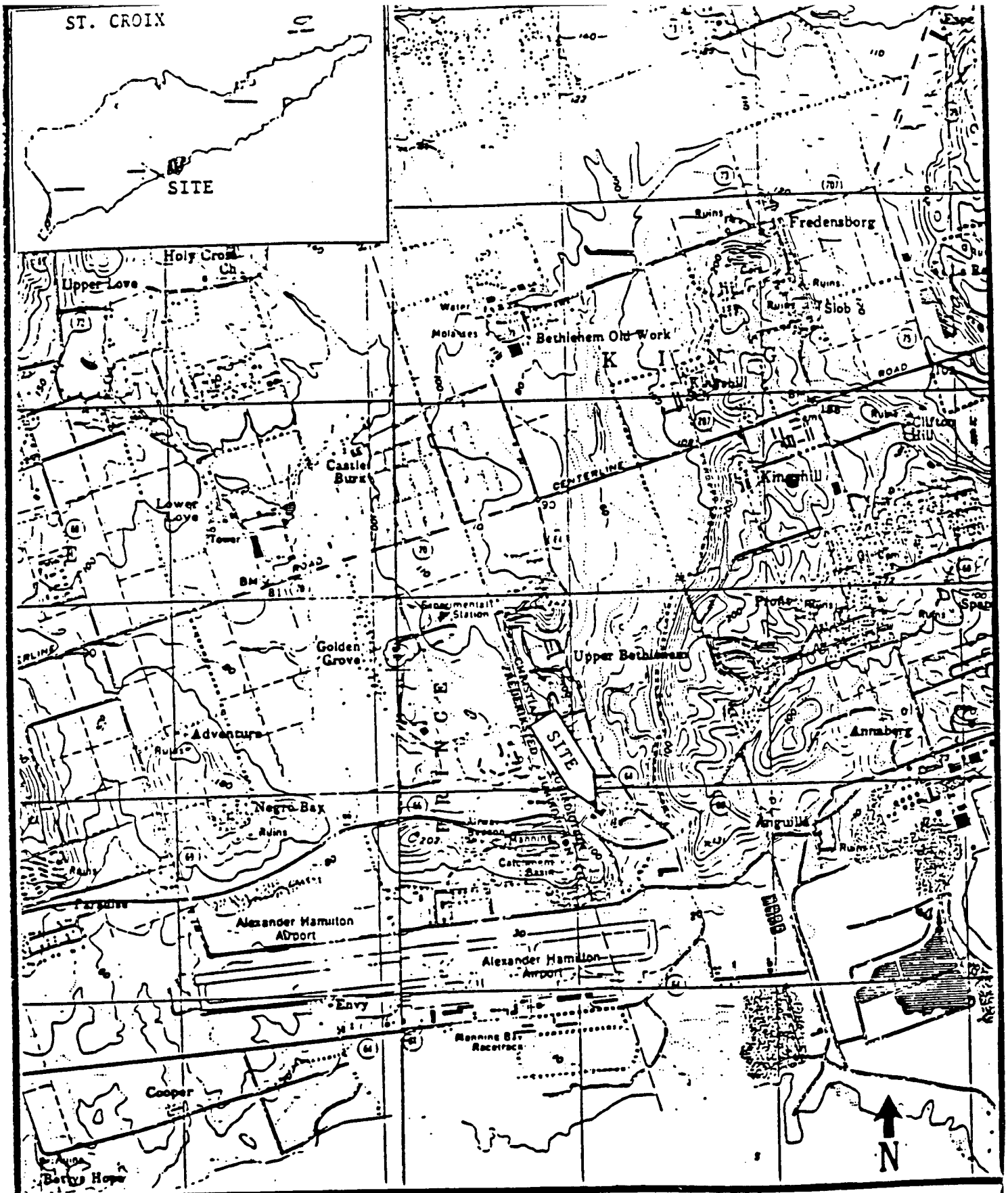
DISAPPROVED: _____ DATE: _____

cc: (After approval is obtained)

J. Marshall, 2DRA
S. Luftig, 2ERR
R. Salkie, 2ERR-ADREPP
B. Sprague, 2ERR-RPB
M. Randol, 2OEP
E. Schaaf, 2ORC-NYCSUP
R. Gherardi, 2OPM-FIN
S. Anderson, PM-214F (EXPRESS MAIL)
T. Fields, OS-210
A. Smith, VIDPNR
C. Moyik, 2ERR-PS
L. Guarneiri, OS-210
J. Rosianski, 2OEP
P. McKechnie, 2IG
D. Henne, 2TATL

ATTACHMENT 1: ERCS CLEANUP CONTRACTOR COSTS

PHASE 1	
Mobilization (personnel and equipment)	$30,000
Personnel Costs (Labor, Per Diem, Travel)	$180,000
Equipment (Trailers, Heavy Equipment, Monitoring Equip.)	$32,000
Materials	$18,000
Total Costs for Phase 1	$260,000
PHASE 2	
Analytical Services (includes transportation)	$80,000
Contingency for Resampling	$30,000
Total Costs for Phase 2	$110,000
PHASE 3	
Mobilization (personnel and equipment)	$30,000
Personnel Costs (Labor, Per Diem, Travel)	$90,000
Equipment (Trailers, Heavy Equipment, Monitoring Equip.)	$15,000
Materials	$16,000
Transportation and Disposal of Wastes	$450,000
Total Costs for Phase 3	$601,000
TOTAL MITIGATION COSTS	$971,000



WESTON — SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM KODAMA	FIGURE 1 SITE LOCATION
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.	TAT PM MENTZEL	VI CHEM SITE ST. CROIX US VI

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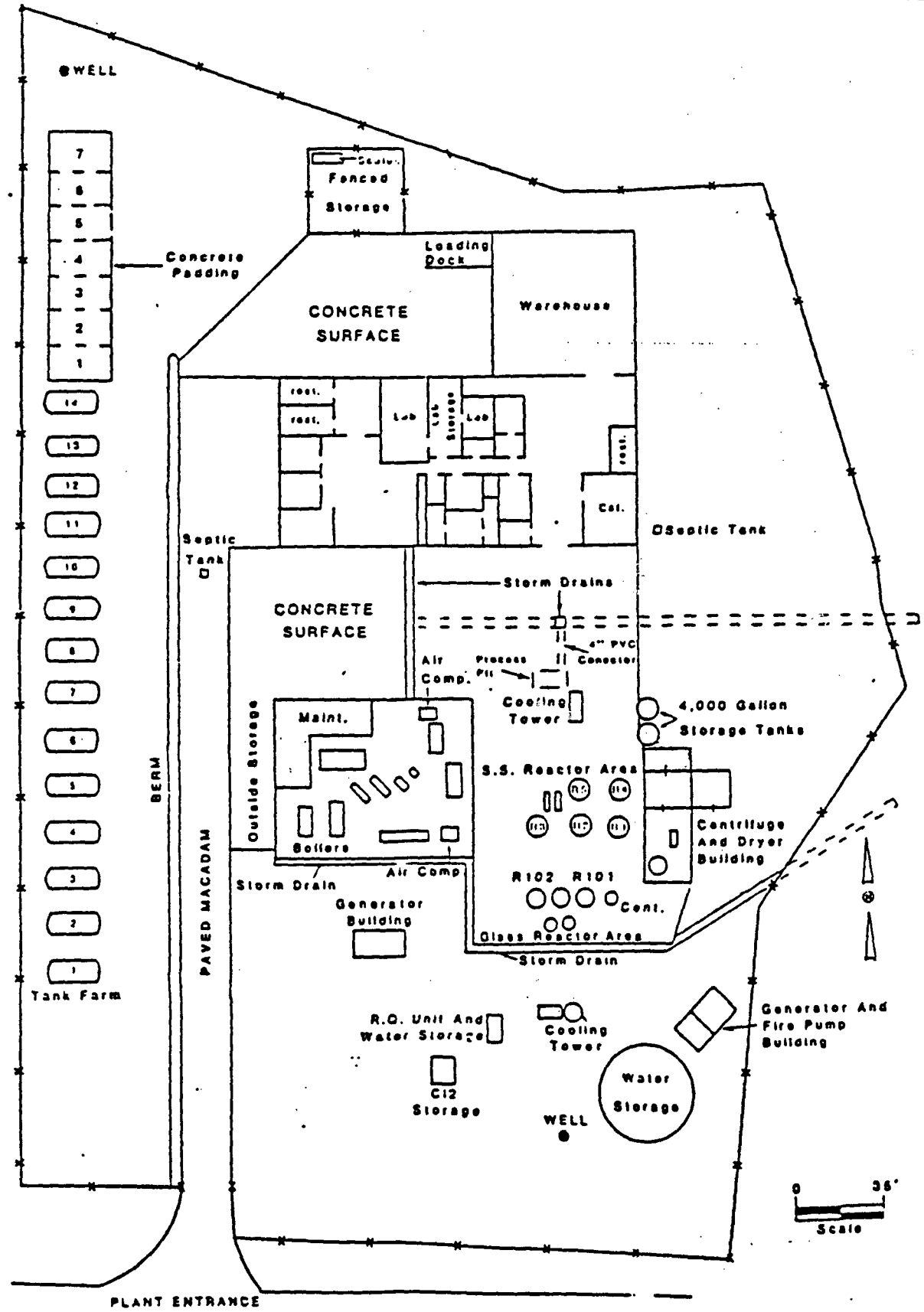

WESTON	SPILL PREVENTION & EMERGENCY RESPONSE DIVISION	EPA PM KODAMA	FIGURE 2 SITE DIAGRAM
In Association with ICF Technology Inc., C.C. Johnson & Associates, Inc., Resource Applications, Inc., Geo/Resource Consultants, Inc., and Environmental Toxicology International, Inc.		TAT PM MENTZEL	VICHEM SITE ST. CROIX US VI

FIGURE 3

Virgin Island Chemical Company
Main Building Inventory Zones

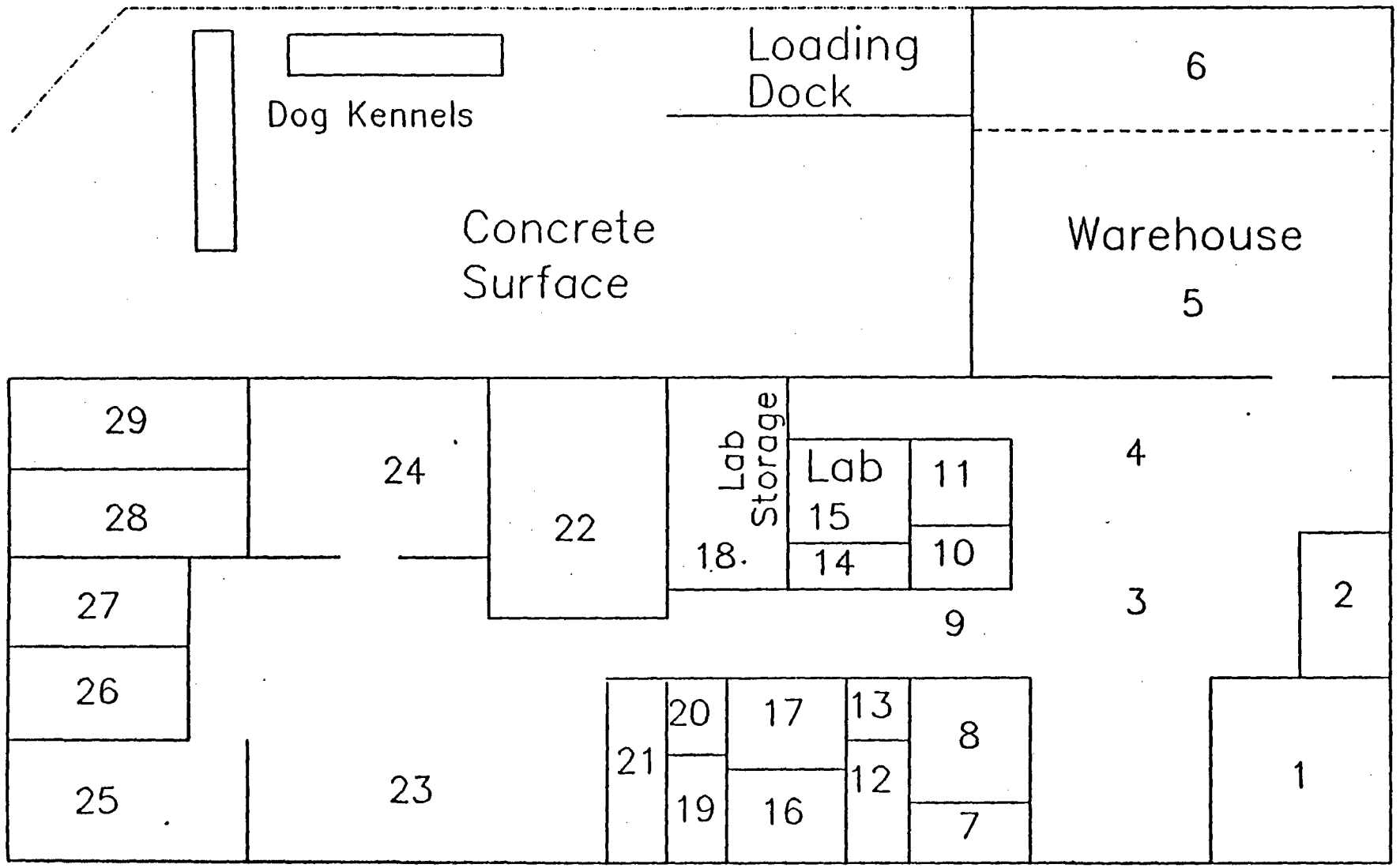

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TABLE 1

Laboratory Reagent Inventory

CHEMICAL NAME	COMPANY	QTY	STATE
1,3-dinitrobenzene	Aldrich Chemical	100 g	solid
1-butanol	J.T.Baker Chemical	500 ml	liquid
1-chlorobutane	MCB	4 L	liquid
1-propanol	J.T.Baker Chemical	500 ml	liquid
18-Crown-6 99%	Aldrich Chemical	25 g	solid
2,2-oxydiethanol	Kodak	1 kg	liquid
2,6-dimethoxybenzoic acid99%	Aldrich Chemical	25 g	solid
2,6-ditertiarybutyl p-cresol	Biesterfeld	500 g	solid
2-hydroxybenzyl alcohol 99%	Aldrich Chemical	25 g	liquid
2-hydroxyethyl ether	Aldrich Chemical	1 kg	liquid
2-methyl-1-butanol 99%	Aldrich Chemical	10 g	liquid
2-methylbutyl amine	American Laboratorie	15 g	liquid
3,3-dimethoxy benzidene	Kodak	100 g	solid
3-hydroxybenzoin acid	Aldrich Chemical	100 g	solid
4-chlorobenzene sulfonamide	Aldrich Chemical	100 g	solid
4-hydroxy 4methyl 2pentanone	Aldrich Chemical	500 g	liquid
4-hydroxybenzoic acid	Aldrich Chemical	50 g	solid
4-methylbenzo phenone 97%	Aldrich Chemical	50 g	solid
9-hydroxyflourene	Aldrich Chemical	2x25 g	solid
Acetic acid	MCB	2x5 lb	liquid
Acetone	Fisher Scientific	4 L	liquid
Acetonitrile	Supelco	1 box	liquid
Alkalinity C,D,E,G	Mogul Corporation	4x2 oz	liquid
Aluminum Chloride	Mallinckrodt	1 lb	solid
Aluminum chloride	Witco Chemical	500 g	solid
Ammonium acetate	Fluka	1 kg	solid
Ammonium acetate	Aldrich Chemical	2 kg	solid
Ammonium acetate purified	Jarchem Industries	250 g	solid
Ammonium hydroxide	Sargent Welch Scient	500 ml	liquid
Ammonium persulfate	J.T.Baker Chemical	2.5 kg	solid
Ammonium persulfate	J.T.Baker Chemical	500 g	solid
Ammonium thiocyanate	Fisher Scientific	500 g	liquid
Amyl alcohol	Mallinckrodt	1 pt	liquid
Arsenic trioxide	Fisher Scientific	2x113g	solid
Barium chloride	Drew Chemical	1 qt	liquid
Barium chloride	Mallinckrodt	500 g	solid
Barium chloride	Fisher Scientific	1 lb	solid
Barium hydroxide	Fisher Scientific	1 lb	solid
Benzaldehyde	J.T.Baker Chemical	500 ml	liquid
Benzene	Tenneco Oil	2x1gal	liquid
Benzhydrol	Kodak	100 g	solid
Benzoic acid	Mobay Chemical	1 lb	solid
Benzoin	Fluka	2x1 kg	solid
Benzoin 98%	Aldrich Chemical	4x500g	solid

TABLE 1

Laboratory Reagent Inventory

CHEMICAL NAME	COMPANY	QTY	STATE
Benzophenone	Aldrich Chemical	500 g	solid
Benzophenone	H&S Chemical	1 bag	solid
Benzophenone	Upjohn	500 g	solid
Benzophenone 99+%	Aldrich Chemical	50 g	solid
Benzoyl chloride	Mobay Chemical	1 lb	solid
Benzyl acetate 99%	Aldrich Chemical	100 g	liquid
Benzyl alcohol	Mallinckrodt	1 pt	liquid
Benzyl benzoate	Aldrich Chemical	100 g	liquid
Benzyl chloride	unknown	4 oz	liquid
Benzyl chloride	Velsicol	500 g	liquid
Benzyl cinnamate 98%	Aldrich Chemical	100 g	solid
Benzyl ether	Aldrich Chemical	1 kg	liquid
Benzyltriethylammoniumchlori	Aldrich Chemical	25 g	solid
Bismuth subnitrate	MCB	1 lb	solid
Bromine	Fisher Scientific	113 g	liquid
Bromophenol blue	Fisher Scientific	5 g	solid
Brucine sulfate	Fisher Scientific	1 oz	solid
Buffer solution pH 10.00	Fisher Chemical	500 ml	liquid
Buffer solution pH 4.00	Fisher Scientific	500 ml	liquid
Buffer solution pH 7.00	Fisher Chemical	500 ml	liquid
CAO-3 BHT	Sherwin Williams	1 bag	solid
Calcium sulfate anhydrous	W.A.Hammond Drierite	4x5 lb	solid
Cello-Seal	Fisher Scientific	25 g	liquid
Chloride F	Mogul Corporation	3 oz	liquid
Chlorodiphenyl methane 98%	Aldrich Chemical	100 g	solid
Chloroform	Fisher Scientific	4 L	liquid
Chromotropic acid Na salt	Fisher Scientific	25 g	solid
Cinnamaldehyde	unknown	2x1 kg	liquid
Citric acid anhydrous	J.T.Baker Chemical	500 g	solid
Citricacidtrisodiumdihydrate	Aldrich Chemical	1 kg	solid
Cobalt chloride	Fisher Scientific	2x1 lb	solid
Color standard 4	unknown	1 oz	liquid
Congo red	Fisher Scientific	25 g	solid
Copper metal	Fisher Scientific	500 g	solid
Cupric sulfate	Fisher Scientific	500 g	solid
Cupric sulfate	Mallinckrodt	500 g	solid
DPD #1,2,3 Reagents	Taylor Chemical	3x1 oz	liquid
Dibenzo 18-Crown-6 98%	Aldrich Chemical	50 g	solid
Dibenzoyl tartaric acid	Knoll Fine Chemicals	1 kg	solid
Dichloroethane 99%	Aldrich Chemical	1 kg	liquid
Dichlorophenyl methane 99%	Aldrich Chemical	25 g	solid
Dichlorotoluene 99%	Aldrich Chemical	100 g	solid
Diethylene glycol	Fisher Scientific	1 qt	liquid
Diisobutyl aluminum hydride	Texas Acres	4 cyl	gas
Diphenylmethane 99%	Aldrich Chemical	500 g	liquid

TABLE 1

Laboratory Reagent Inventory

CHEMICAL NAME	COMPANY	QTY	STATE
Diphenylthiocarbazone	Fisher Scientific	25 g	solid
Eosin Y	Aldrich Chemical	25 g	solid
Ether anhydrous	Fisher Scientific	4 qt	liquid
Ethoxyguin	unknown	4 oz	liquid
Ethyl acetate	Aldrich Chemical	5 gal	liquid
Ethyl acetate	MCB	5x1gal	liquid
Ethyl benzene	Dupont	1 qt	liquid
Ethyl ether 99%	Fisher Scientific	6x500g	liqiud
Ferric ammonium sulfate	Fisher Scientific	500 g	solid
Ferric chloride	unknown	100 ml	liquid
Ferric chloride	Fisher Chemical	1 lb	solid
Ferric chloride anhydrous	Pennwalt Corporation	5x500g	solid
Ferric chloride anhydrous	Kodak	500 g	solid
Ferrous ammonium sulfate	Fisher Chemical	1 lb	solid
Formic acid	unknown	200 g	liquid
Glacial acetic acid	Fisher Chemical	5 lb	liquid
Hydrazine sulfate	Fisher Scientific	4 oz	solid
Hydrazine sulfate	Fisher Scientific	100 g	solid
Hydrochloric acid	MCB	2x6 lb	liquid
Hydrochloric acid	Fisher Chemical	3x1 L	liquid
Hydroxylamine hydrochloride	Fisher Scientific	1 kg	solid
Hydroxylamine hydrochloride	MCB	4 oz	solid
Iodine	Fisher Scientific	500 g	solid
Iron chloride anhydrous	BASF	500 g	solid
Isoamyl alcohol	Fisher Scientific	500 ml	liquid
Isobutyl alcohol	J.T.Baker Chemical	500 ml	liquid
Lead acetate	MCB	1 lb	solid
Lead nitrate	Fisher Scientific	100 g	solid
Lithium perchlorate	Aldrich Chemical	500 g	solid
Magnesium sulfate	Fisher Scientific	500 g	solid
Medical oxygen	MSA	1 cyl	gas
Mercuric chloride	Fisher Scientific	2x100g	solid
Mercuric oxide	Fisher Scientific	500 g	solid
Mesityl oxide	Aldrich Chemical	100 g	solid
Methanol	Fisher Scientific	4 L	liquid
Methenamine	Fisher Scientific	500 g	solid
Methyl alcohol	Mallinckrodt	1 gal	liquid
Methyl orange	Fisher Scientific	113 g	
Methyl red	Fisher Scientific	2x10 g	solid
Monochlorobenzene	PPG Industries	10 oz	liquid
N-methylaniline	Kodak	1 kg	liquid
Na salt of ME salicylate	Sattra Chemical	1 bag	solid
Niacin N.F.	Nepera Chemical	250 g	solid
Nitric acid concentrated	J.T.Baker Chemical	2x8 lb	liquid
Nitrobenzene	Fisher Scientific	1 qt	liquid

TABLE 1

Laboratory Reagent Inventory

CHEMICAL NAME	COMPANY	QTY	STATE
Non aqueous buffer soln.	Beckman Instruments	1 pt	liquid
Nutrizyme	Merck	2 oz	solid
Oil #3	Frich Oil	5 gal	liquid
Paraffin oil	Fisher Scientific	1 qt	liquid
Paraformaldehyde	MCB	1 qt	liquid
Paraformaldehyde prills 91%	Celanese Chemical	1 lb	solid
Perchloric acid	MCB	2x8 lb	liquid
Phenol red	Fisher Scientific	5 g	solid
Phenopthalein	Fisher Scientific	1 oz	solid
Phenylhydrazine	Fisher Scientific	4x4 oz	liquid
Phenylhydrazinehydrochloride	Fisher Scientific	2 lb	solid
Phosphorous pentoxide	Fisher Scientific	1 lb	solid
Piperazine	MCB	100 g	solid
Potassium bromide	Fisher Scientific	5x500g	solid
Potassium butoxide	Callery Chemical	50 g	solid
Potassium chloride	Beckman Instruments	2x6 oz	solid
Potassium cyanate	Fisher Scientific	1 lb	solid
Potassium cyanide	Fisher Scientific	500 g	solid
Potassium dichromate	Fisher Scientific	500 g	solid
Potassium ferrocyanide	Fisher Scientific	3 kg	solid
Potassium hydroxide	Mallinckrodt	2x1 lb	solid
Potassium hydroxide	Fisher Scientific	500 g	solid
Potassium iodide	Drew Chemical	1 qt	liquid
Potassium iodide	Fisher Scientific	2x500g	solid
Potassium periodate	Fisher Scientific	100 g	solid
Potassium platinate	Varlacold Chemical	5 g	solid
Potassium sulfate	Indiana Army Ammo Plant	250 g	solid
Potassium sulfate	Aldrich Chemical	500 g	solid
Potassium sulfate	unknown	50 g	solid
Potassium thiocyanate	Fisher Scientific	500 g	solid
Resorcinol	Koppers	3 bags	solid
Salicylaldehyde 99+%	Aldrich Chemical	100 g	liquid
Salicylic acid	Aldrich Chemical	100 g	solid
Salicylic acid	Aceto Chemical	500 g	solid
Salicylic acid sodium salt	Aldrich Chemical	100 g	solid
Sicapent	MCB	2.8 L	solid
Silica gel dessicant	Davison Chemical	2x1 qt	solid
Silver nitrate	J.T.Baker Chemical	1 oz	solid
Silver nitrate	Sargent Welch Scientific	30 g	solid
Sodium Chloride	Fisher Scientific	500 g	solid
Sodium acetate	Sattra Chemical	3 bags	solid
Sodium acetate anhydrous	Niacet Corporation	250 g	solid
Sodium acetate anhydrous	CDF Chimie Noth America	2x500g	solid
Sodium amide	Farchan Research Lab	500 g	solid
Sodium benzoate	Sattra Chemical	1 bag	solid

TABLE 1

Laboratory Reagent Inventory

CHEMICAL NAME	COMPANY	QTY	STATE
Sodium benzoate	Dastech International	1 bag	solid
Sodium benzoate	Ishihara Corporation	250 g	solid
Sodium benzoate	Pfizer	100 lb	solid
Sodium borohydride	Fisher Scientific	4x25 g	solid
Sodium carbonate	Fisher Scientific	1 kg	solid
Sodium carbonate anhydrous	Mallinckrodt	1 lb	solid
Sodium chlorate	Hooker Chemical	1 box	solid
Sodium dichromate	Fisher Scientific	10 kg	solid
Sodium formate	unknown	5 lb	solid
Sodium hydride	Thiokol/Ventron Division	1 lb	solid
Sodium hydroxide	Mallinckrodt	500 g	solid
Sodium metal	RMI	2 boxs	solid
Sodium nitrite	Fisher Scientific	2x500g	solid
Sodium nitro ferricyanide	MCB	4 oz	solid
Sodium sulfate	Fisher Scientific	500 g	solid
Sodium tartrate	J.T.Baker Chemical	2 oz	solid
Sodium tartrate	Fisher Scientific	6x113g	solid
Sodium thiosulfate	Fisher Scientific	2x1 lb	solid
Succinic anhydride	MCB	6x250g	solid
Succinic anhydride	Aldrich Chemical	2x1 kg	solid
Sulfamic acid	Fisher Scientific	500 g	solid
Sulfanilic acid	H&S Chemical	1 bag	solid
Sulfite O,P,Q	Mogul Corporation	3x2 oz	liquid
Sulfuric acid	J.T.Baker Chemical	10 lb	liquid
Tetraphenolboron sodium 99%	Aldrich Chemical	25 g	solid
Thiopene	Kodak	100 g	liquid
Total alkylinity indicator	Drew Chemical	1 qt	liquid
Tributyl borate	Aldrich Chemical	750 g	liquid
Trichloroethylene	Mallinckrodt	1 pt	liquid
Triethyl borate 97%	Aldrich Chemical	100 g	liquid
Triethylenediamine	Air Products	250 g	solid
Uranyl acetate	unknown	500 g	solid
Weedox C/R 250 herbicide	Southern Mill Creek Prod.	2x5gal	liquid
Xylene	Fisher Scientific	5x1 L	liquid
Zinc chloride	Fisher Scientific	500 g	solid
Zinc chloride anhydrous	Mineral Research	1 lb	solid
p-chlorobenzene sulfonamide	H&S Chemical	2 bags	solid
p-naptholbenzein	Fisher Scientific	25 g	solid
p-toluenesulfonicmonohydrate	Aldrich Chemical	500 g	solid
pH indicator A	Mogul Corporation	2 oz	liquid
z Miscellaneous unknowns	on site lab glassware	280bot	misc.
z Miscellaneous unknowns	on site one oz bottles	238bot	liquid

TABLE 2

Drum Inventory

Chemical Name	Company	Qty	State	Cond	Dates
Acetone	Ashland Chemical	55 G	liquid	good	
Acetylene	VI Gas	2 cyl	gas	good	
Activated carbon	Calgon Corporation	30 bag	solid	good	
All-weather patch material	Revere Chemical	55 G	solid	fair	
Amersite 2	Valley Freight Syst.	55 G	liquid	fair	
Ashland MeOH	Ashland Chemical	5 G	liquid	good	
Benzyl acetate	Island Chemical	21x55G	liquid	fair	
Benzyl chloride	Velsicol Corporation	28x55G	liquid	fair	
Chlorine	VI Gas	1 cyl	gas	poor	
Chloroform	unknown	55 G	liquid	good	
Crofox	Cerfact Laboratories	55 G	liquid	poor	
Crystal Clear floor finish	Cerfact Laboratories	2x20 G	liquid	good	
Degreaser	unknown	55 G	liquid	good	
Drewtrol 8500	Valley Freight Syst.	55 G	liquid	poor	
Ethyl alcohol	unknown	115x55	liquid	poor	
Filteraid	unknown	10x30G	solid	poor	
Glacial acetic acid	Celanese Chemical	13x55G	liquid	good	
Glycol	Island Chemical	20x55G	liquid	poor	1984
Humisorb	Culligan	30 G	solid	fair	
Hydrochloric acid	Certified Laboratory	55 G	liquid	poor	
Hydrogen chloride	VI Gas	1 cyl	gas	poor	
Insulation (asbestos??)	unknown	13 box	solid	good	
Insulation fiberglass	unknown	7 box	solid	good	
Lubricating oil	Texaco	2x10 G	liquid	good	
Lubricating oil	Texaco	5x55 G	liquid	good	
Magnesium sulfate trihydrate	Tomita Pharmaceutica	6x25kg	solid	fair	
Methanol	Ashland Chemical	5x55 G	liquid	good	
Methanol	unknown	3x55 G	liquid	fair	
Methyl isobutyl carbinol	Van Waters & Rogers	12x55G	liquid	good	1984
Methyl isobutyl ketone	Ashland Chemical	55 G	liquid	good	

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TABLE 2

Drum Inventory

Chemical Name	Company	Qty	State	Cond	Dates
Micro media filter sheets	Ertel Engineering	18 box	solid	good	
Oxygen	VI Gas	3 cyl	gas	good	
Oxygen	Santa Maria Gases	1 cyl	gas	good	
Paints	unknown	44x5 G	liquid	fair	
Paints	unknown	53x1 G	liquid	fair	
Paints	International Paint	97x5 G	liquid	fair	
Paints	International Paint	21x1 G	liquid	fair	
Para-phenetidin	unknown	55 G	liquid	fair	1983
Pentosin	Deutsche Pentosin	20 L	liquid	fair	
Potassium acetate	Jarchem Industries	8x100#	solid	good	
Potassium sulfate	unknown	50 bag	solid	good	
Powdered filter media	Ionics	2 boxs	solid	good	
Propane	unknown	4 cyl	gas	good	
Purafil II	unknown	15x10G	solid	good	
Quinine sulfate	Kimafarma	20 G	liquid	good	
Rinseline injector fluid	Bob Chamber Ltd.	55 G	liquid	good	
Rout	Cerfact Laboratories	20 G	solid	poor	
Salicylic acid	Rhone-Poulenc	27drum	solid	good	
Salt	unknown	2x30 G	solid	good	
Soda ash	Allied Chemical	15x100	solid	poor	
Sodium acetate anhydrous	unknown	50 lb	solid	good	
Sodium acetate anhydrous	Jarchem Industries	200 lb	solid	poor	
Sodium bicarbonate	Stauffer Chemical	8x100#	solid	poor	
Sodium hexa-meta phosphate	FMC	200 lb	solid	good	
Sodium hydroxide	Mantek	55 G	liquid	poor	
Sodium hydroxide	Manuel del Valle Inc	12x55G	liquid	good	
Spent toluene/acetone	unknown	2x55 G	liquid	fair	
Sterling salt crystals	unknown	50 lb	solid	poor	
Sulfamic acid	Dupont	400 lb	solid	poor	
Tartaric acid	Pfizer Chemical	15x100	solid	poor	
Thinner	unknown	6x1 G	liquid	fair	

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TABLE 2

Drum Inventory

Chemical Name	Company	Qty	State	Cond	Dates
Thinner	Advance	55 G	liquid	fair	
Toluene	Ashland Chemical	3x55 G	liquid	fair	
Toluene	unknown	5x55 G	liquid	good	
Triethylamine	Air Products	55 G	liquid	good	1984
Waste oil	unknown	2x55 G	liquid	good	
z Empty drums	unknown	130	n/a	fair	
z Miscellaneous unknowns	on site containers	25	misc.	poor	

TABLE 3

CERCLA Hazardous Substances and
Statutory Codes (40 CFR Sec. 302.4)

Chemical	Codes
1,3-dinitrobenzene	1
1-butanol	4
3,3-dimethoxy benzidene	4
Acetic acid	1
Acetone	4
Acetonitrile	4
Ammonium acetate	1
Ammonium hydroxide	1
Ammonium thiocyanate	1
Arsenic trioxide	1,4
Asbestos	2,3
Benzene	1,2,3,4
Benzoic acid	1
Benzoyl chloride	1
Benzyl chloride	1,4
Chlorine	1
Chloroform	1,2,4
Copper metal	2
Cupric sulfate	1
Ethyl acetate	4
Ethyl benzene	1,2
Ethyl ether 99%	4
Ferric chloride	1
Ferrous ammonium sulfate	1
Formic acid	1,4
Glacial acetic acid	1
Hydrochloric acid	1
Isobutyl alcohol	4
Lead acetate	1,4
Lead nitrate	1
Mercuric chloride	2
Mercuric oxide	2
Methanol	4
Methyl alcohol	4
Methyl isobutyl ketone	4
Nitric acid concentrated	1
Nitrobenzene	1,2,4
Paraformaldehyde	1
Potassium cyanide	1,4
Potassium hydroxide	1
Resorcinol	1,4
Silver nitrate	1
Sodium hydroxide	1
Sodium metal	1

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TABLE 3

CERCLA Hazardous Substances and
Statutory Codes (40 CFR Sec. 302.4)

Chemical	Codes
Sodium nitrite	1
Sulfuric acid	1
Toluene	1,2,4
Trichloroethylene	1,2,4
Triethylamine	1
Uranyl acetate	1
Xylene	1,4
Zinc chloride	1

1= Clean Water Act (CWA) Section 311 (b) 4
2= Clean Water Act (CWA) Section 307 (a)
3= Clean Air Act (CAA) Section 112
4= Resource Conservation Recovery Act (RCRA) Section 3001

TABLE 4

Summary of Toxicological Effects of
Some Identified Compounds

Chemical Name	Health Effects Codes
1,3-dinitrobenzene	A,B,E,I
1-butanol	A,E
3,3-dimethoxy benzidene	A,B,C,E,F
Acetic acid	A,I
Acetone	A,E
Acetonitrile	A,B,C,D,E,I
Ammonium acetate	A,E
Ammonium hydroxide	A,E
Ammonium thiocyanate	A,E
Arsenic trioxide	A,B,C,D,E,F
Asbestos	D,E,F
Benzene	A,E,F,I
Benzoic acid	A,E
Benzoyl chloride	A,E
Benzyl chloride	A,E
Chlorine	A,E
Chloroform	A,B,C,E,F
Copper metal	A,B,C,E
Cupric sulfate	A,E
Ethyl acetate	A,E
Ethyl benzene	A,E,I
Ethyl ether 99%	A,E,I
Ferric chloride	A,E
Ferrous ammonium sulfate	A,E
Formic acid	A,B,C,E
Hydrochloric acid	A,E
Isobutyl alcohol	A,E
Lead acetate	A,E
Lead nitrate	A,E
Mercuric chloride	A,E
Mercuric oxide	A,E
Methanol	A,E,I
Methyl isobutyl ketone	A,E
Nitric acid concentrated	A,E
Nitrobenzene	A,B,C,E,I
Paraformaldehyde	A,E
Potassium cyanide	A,E
Potassium hydroxide	A,E
Resorcinol	A,E
Silver nitrate	A,E
Sodium hydroxide	A,E
Sodium metal	A,E
Sodium nitrite	A,E,F
Sulfuric acid	A,E

TABLE 4

Summary of Toxicological Effects of Some Identified Compounds

Chemical Name	Health Effects Codes
Toluene	A,B,C,E,I
Trichloroethylene	A,B,C,E,F,I
Triethylamine	A,E
Xylene	A,B,C,E,I
Zinc chloride	A,E

A= Eye, skin, respiratory and mucous membrane irritant

B= Liver damage

C= Kidney damage

D= Lung damage

E= Toxic by inhalation, ingestion, or dermal contact

F= Carcinogenic

G= Teratogenic

H= Mutagenic

I= Central nervous system effects

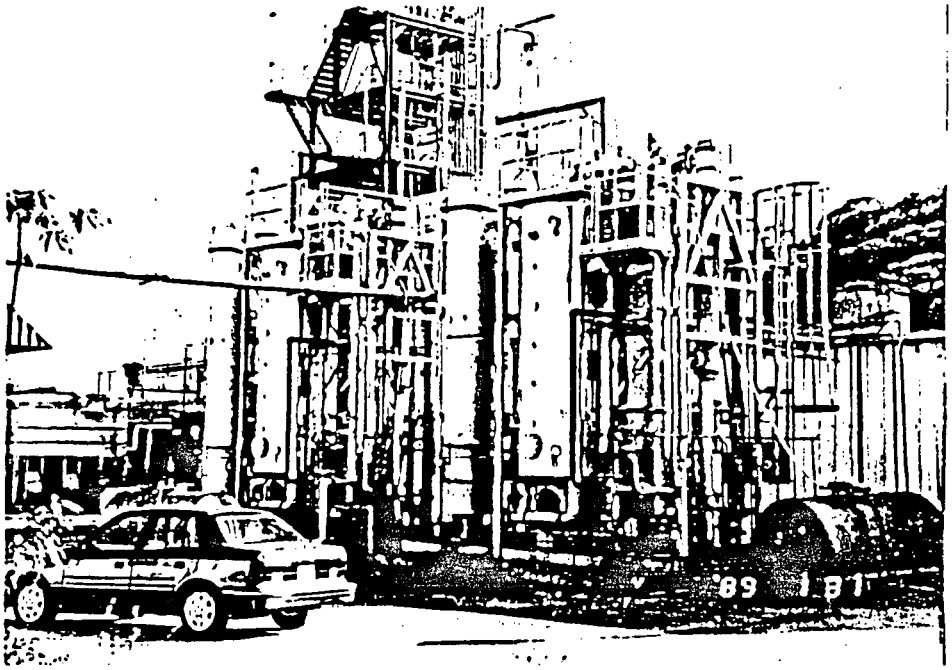

Photo #1. Virgin Island Chemical Company
Alcohol dehydration apparatus

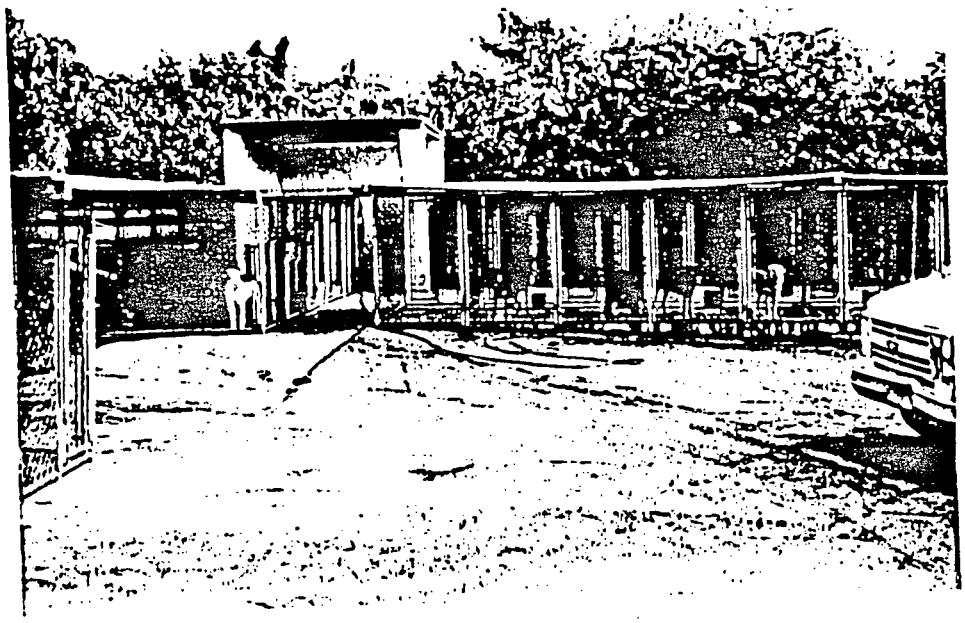

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Photo #2. Dog kennel operating on site

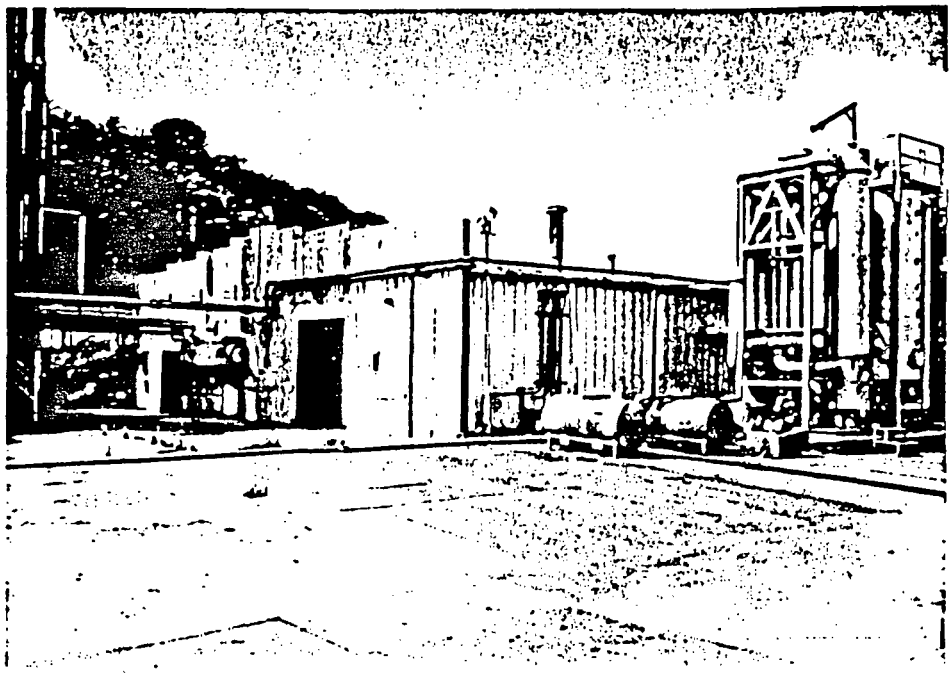

Photo #3. Maintenance building

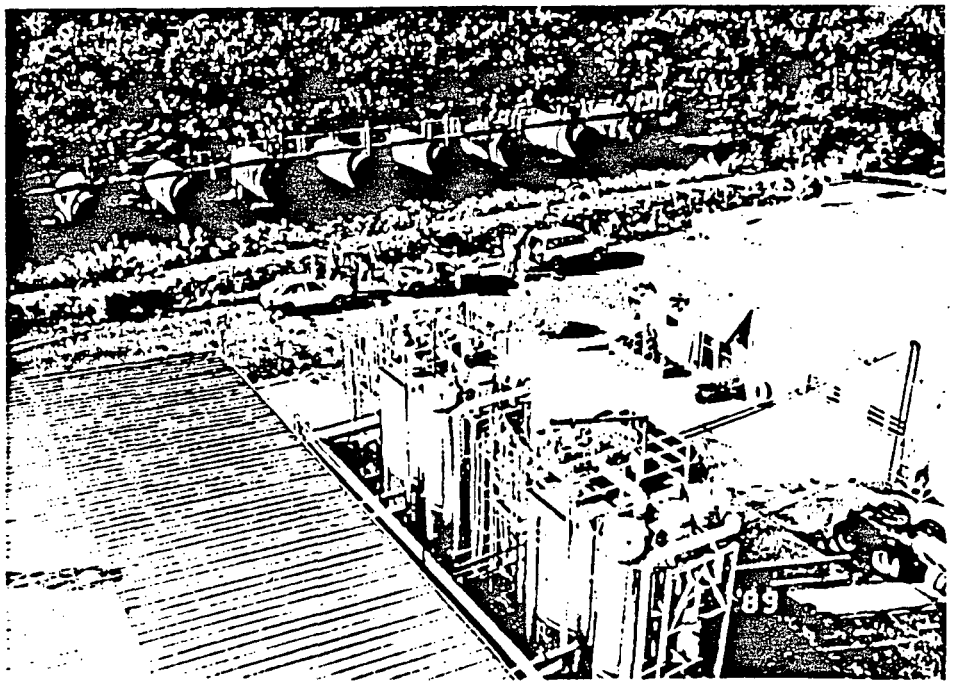

Photo #4. View of tanks, main building, and alcohol dehydration unit

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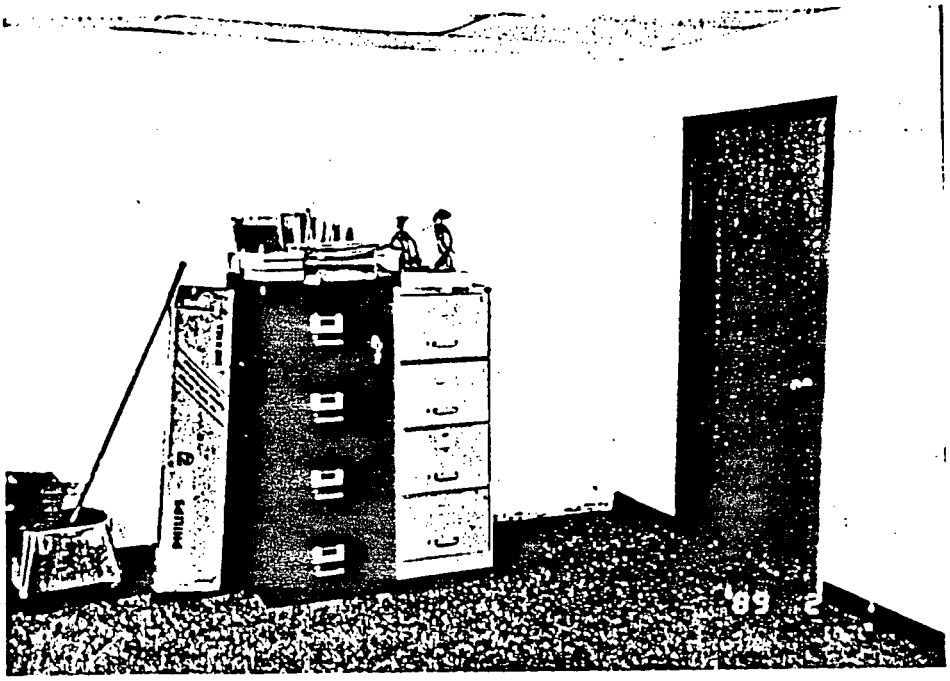

Photo #5. Main building office area 23

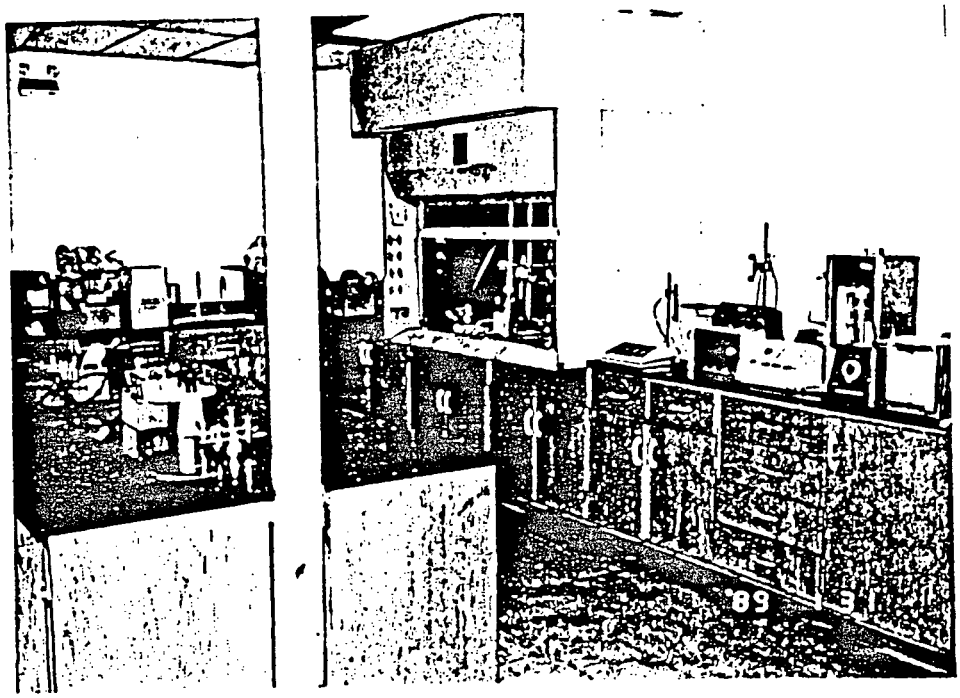

Photo #6. Area 22 lab in the main building

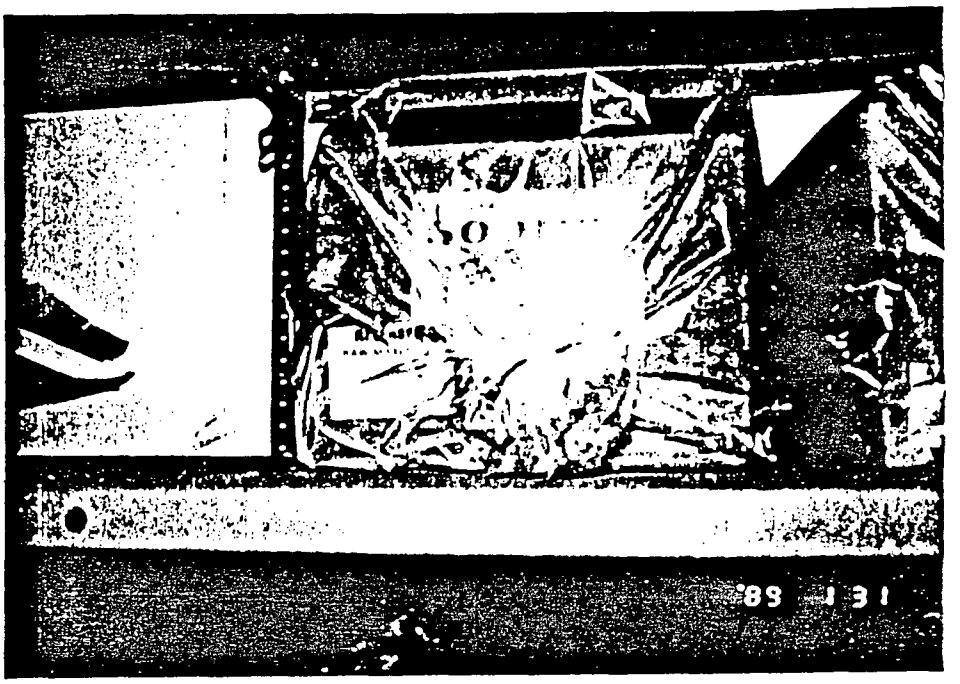

Photo #7. Virgin Island Chemical Company
Sodium metal in area 18

Photo #8. Area 18 chemical and glassware storage

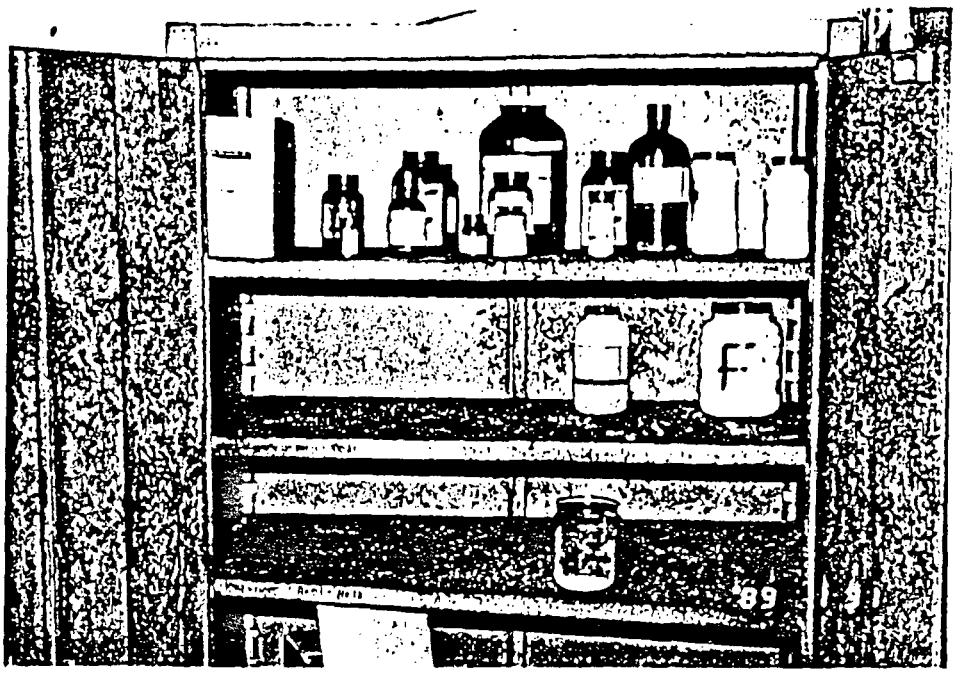

Photo #9. Incompatable storage of lab reagents

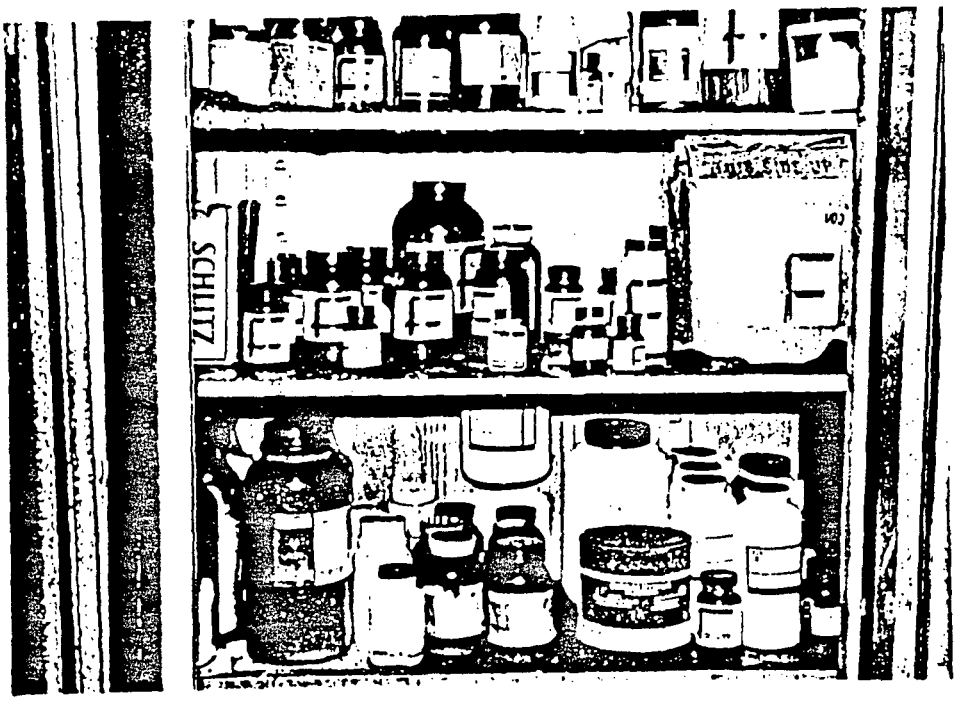

Photo #10. Incompatable and leaking storage of lab reagents

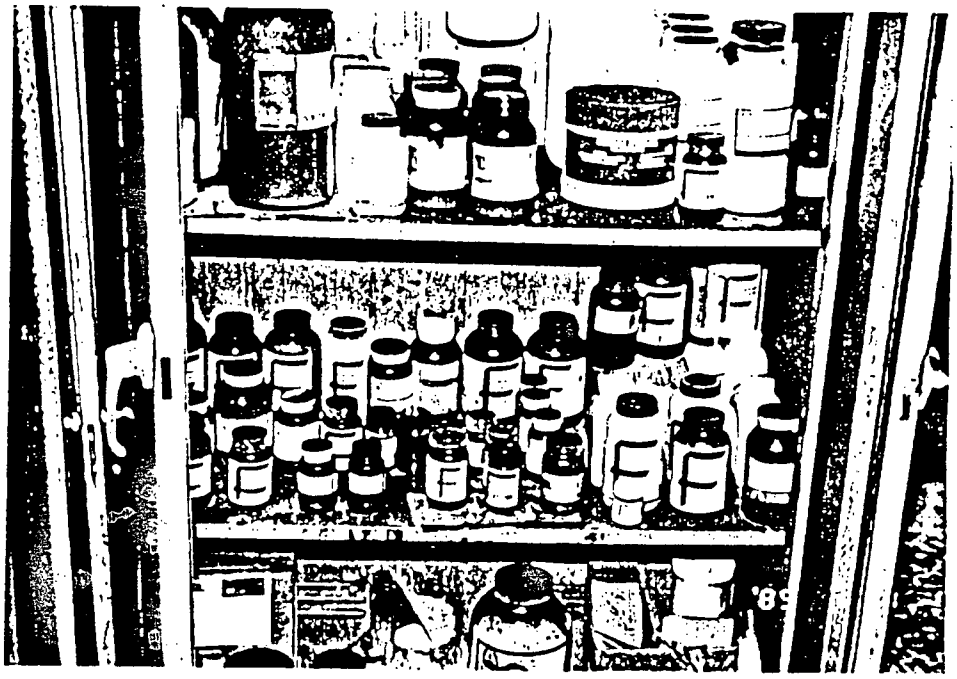

Photo #11. Incompatable and leaking storage of lab reagents

Photo #12. Incompatable storage of lab reagents

Photo #13. Paint cans in area 1

Photo #14. Cylinder of chlorine

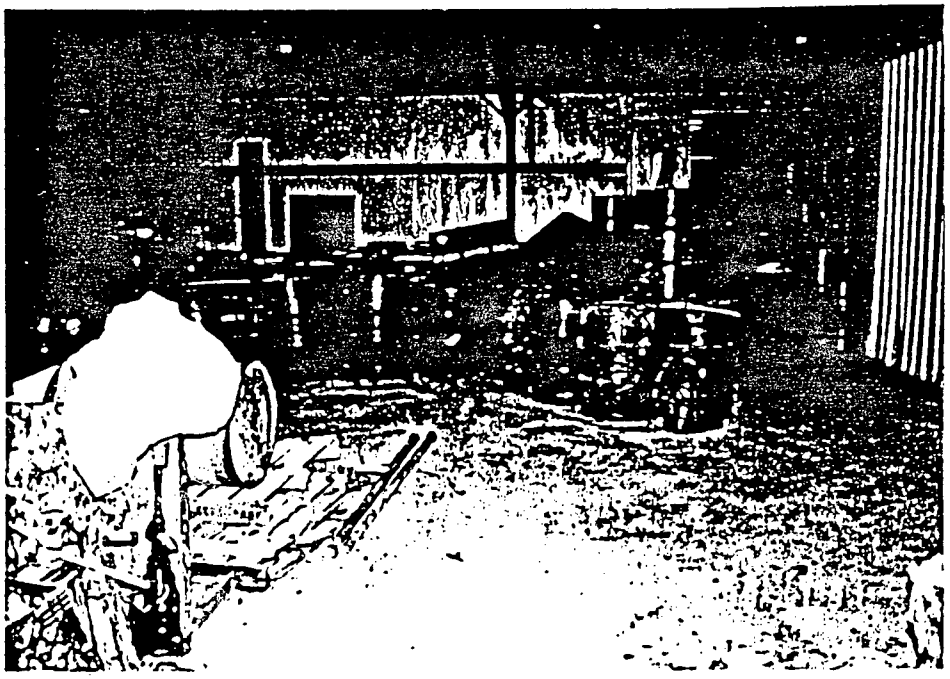

Photo #15. Drums in area 4; note water on the floor

Photo #16. Drum contents undergoing a reaction

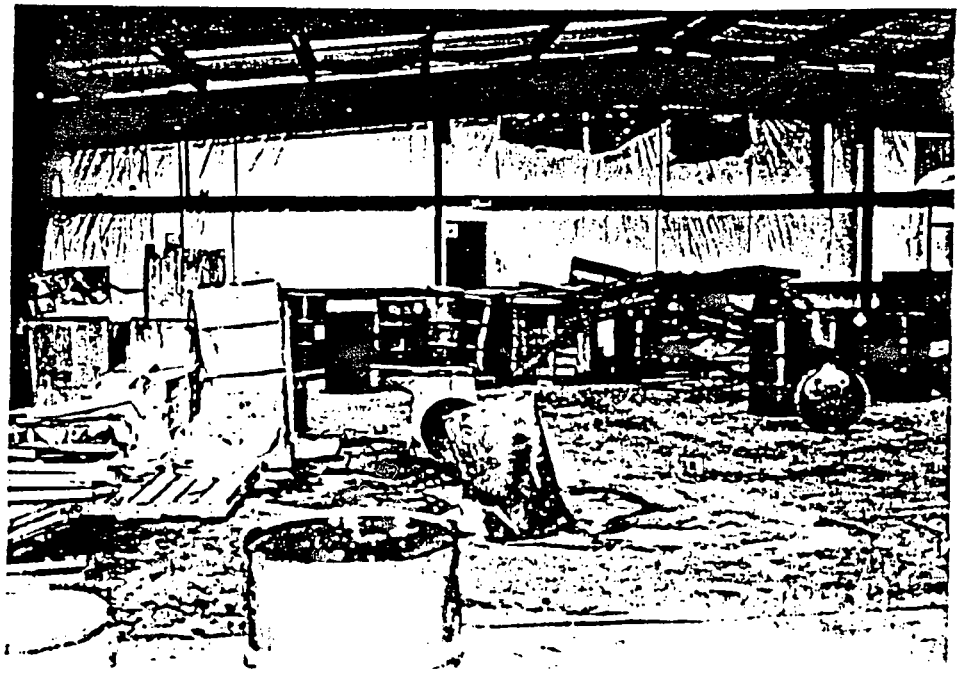

Photo #17. Virgin Island Chemical Company
Drums and debris in area 5

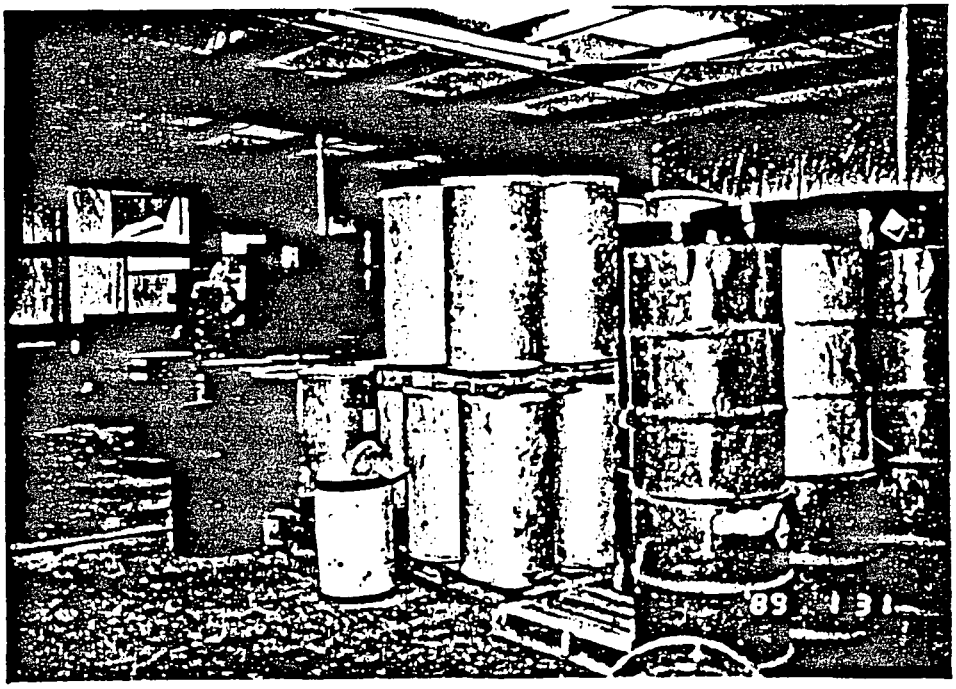

Photo #18. Drums in area 5

Photo #19. Deteriorating drums in area 6

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Photo #20. Drums and floor contamination in area 5

Photo #21. Deteriorating bags in area 6

Photo #22. Drums in area 6

Photo #21. Deteriorating bags in area 6

Photo #22. Drums in area 6