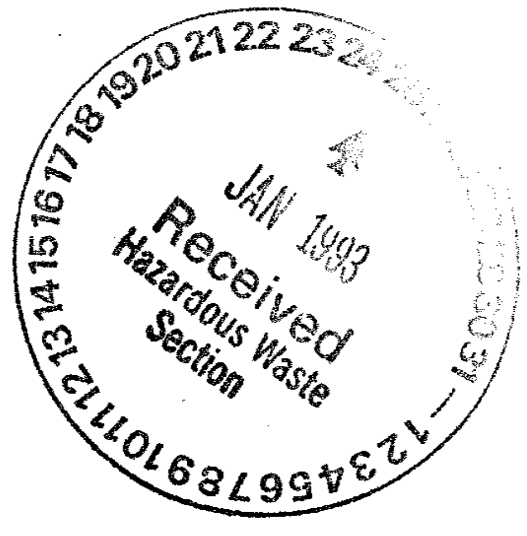

FINAL REPORT
RCRA FACILITY ASSESSMENT
RALEIGH, WAKE COUNTY, NORTH CAROLINA

Prepared for

U.S. Environmental Protection Agency
Region IV
Atlanta, Georgia

Work Assignment No.	: R04031C04073
EPA Region	: IV
Site No.	: NCD003185238
Contract No.	: 68-W9-004
CDM Federal Programs Corporation Document No.	: TES7-R04031-FR-DBHT
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EXECUTIVE SUMMARY

CDM FEDERAL PROGRAMS CORPORATION received Work Assignment No. R04031 from U.S. Environmental Protection Agency under EPA Contract No. 68-W9-0004 (TES VII) to conduct a RCRA Facility Assessment (RFA) at the Alcatel Network Systems Company, Raleigh, North Carolina. The purpose of this Work Assignment was to evaluate actual or potential releases from Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at the facility, and to determine the need for corrective action. This report presents the findings of the Preliminary Review and Visual Site Inspection of the RFA process.

Alcatel Network Systems has been operating in Raleigh, North Carolina since 1958. Prior to 1990, Alcatel developed, manufactured and marketed telecommunications transmission equipment for the communications industry in addition to marine navigation and satellite earth station equipment. The company site covers 25 acres in an industrial/commercial section of Raleigh, and the main site features include a main building (235,000 square feet), drum and container storage areas, a closed wastewater treatment plant, warehouses and small structures. The facility discontinued its manufacturing and processing business in 1990 and is presently engaged in research and development and administrative functions.

Since the termination of the equipment manufacturing and processing, Alcatel has been active in the closure and refurbishment of drain lines, storage and treatment units, and the removal of equipment used in metal finishing and circuit board manufacturing.

Hazardous wastes generated and stored at the facility included degreasers such as spent 1,1,1 trichloroethane and freon (F001/F002); electroplating sludges containing cyanide (F008); used flux (D001/D002/D008) consisting of alcohol, glutamate polymer and water contaminated with lead and tin; spent tin/lead stripping (D002/D008) containing ammonia bifluoride, tin, copper, and lead; spent paint remover (D002); and paint and

paint thinner (D001/F005). Alcatel obtained a RCRA permit to store the aforementioned wastes on two uncovered pads and in a special roll on/off container and containment pad. The on-site wastewater treatment plant treated 320,000 gallons per day and the treated effluent was discharged to the Raleigh POTW. Dewatered metal hydroxide sludge (F006), which was acidic and contained various concentrations of copper, tin, lead, iron, zinc, chromium, aluminum, and nickel was generated from the treatment process and was the only waste that was stored in the roll on/off containers. Presently, Alcatel operates under a RCRA storage permit (expires August 5, 1993).

The facility is located in the Piedmont Physiographic Province Hydrogeologic region of North Carolina. The site is underlain by a Precambrian to early Paleozoic Pegmatite gneiss injection complex. The features are significant to the site as they control the occurrence and movement of groundwater. Shallow groundwater beneath the facility occurs under phraetic (water table) conditions. Deeper groundwater is found in secondary openings of the hard rock complex formed by faults, joints, and foliations. The depth of groundwater is approximately 12 feet below land surface (bls). Shallow groundwater exhibits horizontal flow to the southeast with deeper groundwater flow in fractured rock.

The vast majority of the citizens of Raleigh rely on surface water as the potable supply source. The city obtains its water supply from Falls Lake Reservoir, 16 miles north of the site. The Reservoir serves over 75,000 residential and commercial connections. An undisclosed number of private well users exist within three miles of the site with well depths ranging from 40 to 200 feet bls.

The VSI identified seven SWMUs and one AOC, of which three have been recommended for Phase II sampling. The units identified include the inground holding tanks, wastewater treatment plant, spent etchant tank, RCRA storage pads (one and two), and RCRA sludge containment pad, and the process effluent/drainage system alleyway (AOC). The one requiring further sampling is the process effluent/drainage

system alleyway. During 1989, Alcatel detected elevated levels of copper and lead in the soils. Several areas of soil contamination were identified. Since that time several contractors have conducted numerous sampling investigations, installed a network of monitoring wells around the site and excavated and disposed of off site over 277 tons of contaminated soil. Contaminants of concern detected in groundwater samples have been copper, 1,1,1-trichloroethane, PCE, and 1,1-dichloroethane. Presently, Alcatel has implemented a groundwater sampling program and recommendations are to further define contaminant migration in the fractured rock aquifer, identify capture zones for pump and treat, and collect surface and subsurface soil samples from areas adjacent to several SWMUs and the AOC.

1.0 INTRODUCTION

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) authorize EPA to require corrective action for releases of hazardous wastes and/or hazardous constituents from Solid Waste Management Units (SWMUs) and other Areas of Concern (AOCs) at all operating, closed or closing RCRA facilities. The intent of this authority is to address previously unregulated releases to air, surface water, soil and groundwater, as well as the generation of subsurface gas. The first phase of the corrective action program, as established by EPA, is development of a RCRA Facility Preliminary Review (PR) of all available relevant documents, a Visual Site Inspection (VSI) and, if appropriate, a Sampling Visit (SV), which may be performed as Phase II of the RFA investigation. Based on the results of these investigations, the SWMUs and AOCs at the facility are identified, and each is assessed as to its potential for release of hazardous constituents and need for corrective action.

1.1 FILE REVIEW AND VSI

This RFA report is based on a review of file material collected from the EPA Regional and State offices, and from observations documented during the VSI. The file review was conducted during November 1991, and included the procurement of RCRA and CERCLA files available at the EPA Region IV, Atlanta, Georgia office and the North Carolina Department of Environment, Health and Natural Resources (NCDEHNR) office in Raleigh, North Carolina. Based on the file review, a tentative list of SWMUs and AOCs was identified to establish an agenda for the VSI. Additional information was provided by facility personnel and their contractors during the VSI to enhance and address questions raised during the VSI.

The VSI was conducted on November 7, 1991 at the Alcatel Network Systems facility in Raleigh, North Carolina. Robert Rose and Dale Trimpe, who comprised the VSI contracting team arrived at the facility at 0900 hours. The team was greeted by Dikran Kabbendjian, Supervisor of the Human Resources Services of Alcatel Network Systems, who escorted the team to a conference room for an introductory meeting (Ref. 1).

Attendees

Robert Rose
Work Assignment Manager
CDM Federal Programs Corporation

Dale Trimpe
Inspection Team Member
CDM Federal Programs Corporation

Dikran Kabbendjian
Supervisor, Human Resources Services
Alcatel Network Systems

Kathleen Lawson
Environmental Engineer
Solid Waste Management Division
North Carolina Department of Environmental Health,
and Natural Resources

Robert McDaniel, P.G.
Hydrogeologist
Solid Waste Management Division
North Carolina Department of Environmental Health,
and Natural Resources

During the meeting, the day's schedule and pertinent informational needs were discussed and the approximate locations of SWMUs and AOCs past and present, were identified. An itinerary was established for the day with the VSI to be conducted in the morning and detailed discussions for all SWMUs and AOCs identified to take place in the afternoon (Ref. 1).

Photo documentation was addressed with facility personnel and the VSI team was advised that research and development areas were not to be photographed. At the request of facility personnel, photographs were to be limited to outside process and storage areas and the old indoor production and reconstruction areas.

A tour of the facility was conducted beginning with the old production/processing areas within the main building. The network of drainage lines, channels, and piping, which have been either filled, removed or closed in place, were followed to what is presently the cafeteria, kitchen, printing room, partitioned offices and corridors.

From the main building, the RCRA storage units and sludge container area were viewed followed by the wastewater treatment plant, related holding tanks, structures and associated equipment. In addition to the SWMUs and AOC identified during the VSI, an inspection of the facility property which included warehouses, storm water drain structures, railroad access line and several miscellaneous areas was conducted. Upon completion of the inspection, the VSI team reconvened in the plant conference room for closing discussions with facility personnel. The VSI team departed the Alcatel Network Systems property at 1630 hours on November 7, 1991.

The weather conditions during the VSI were very favorable for photodocumentation of outdoor SWMUs and AOCs. There was no precipitation, clear skies, light winds and temperatures ranged from 48° to 60° F. during the day (Appendix A).

2.0 FACILITY DESCRIPTION

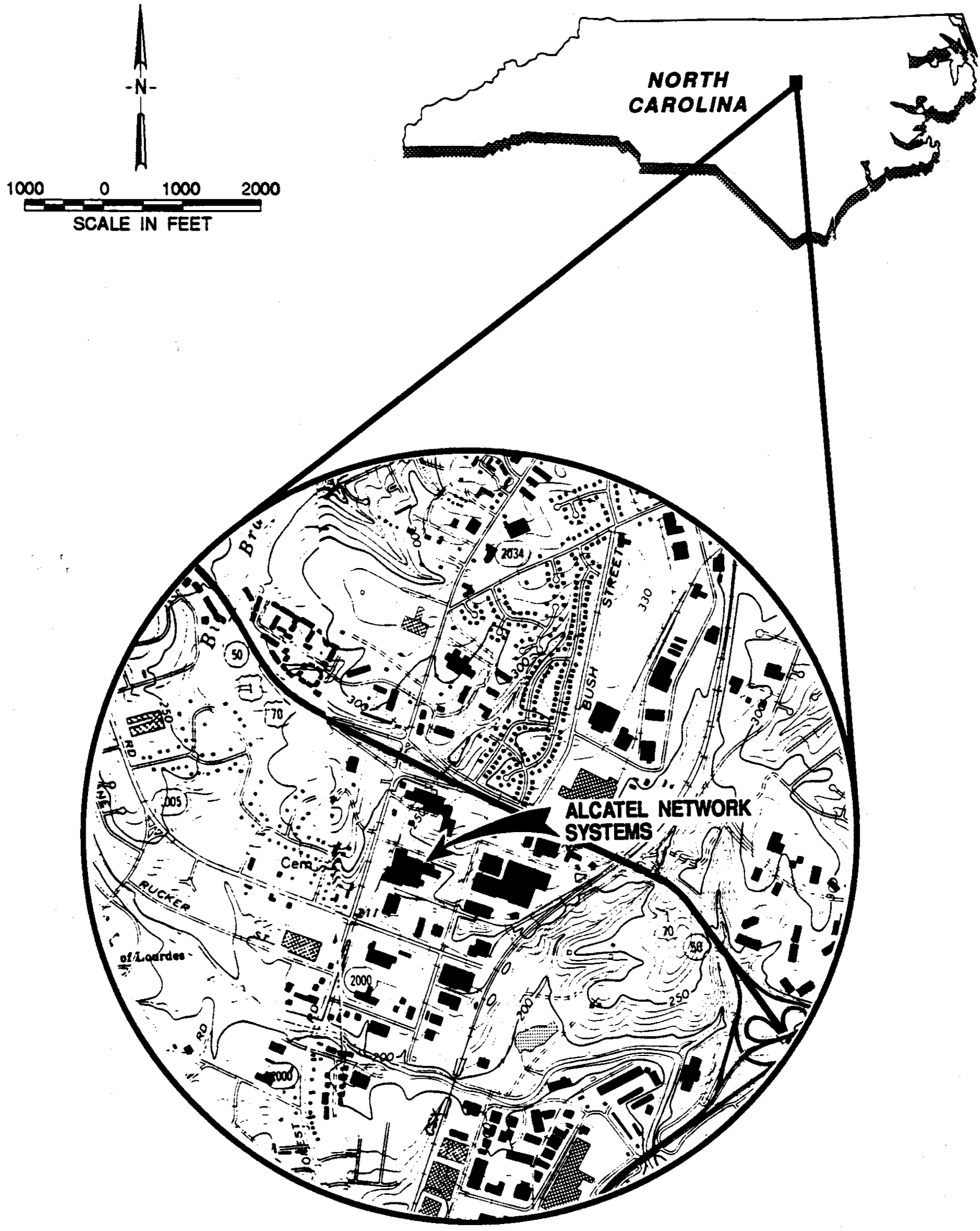
2.1 FACILITY LOCATION/FEATURES

The Alcatel Network Systems Corporation (Alcatel) is located at 2912 Wake Forest Road in Raleigh, Wake County, North Carolina. The EPA RCRA identification number for the site is NCD003185238. The plant is approximately three miles northeast of downtown Raleigh near the intersection of Highway 401 and I-64 bypass. Alcatel is situated more specifically at 35° 49' 17" north latitude and 78° 37' 30" west longitude on the United States Geological Survey (USGS), Raleigh, East/West, North Carolina 7.5" quadrangle topographic maps (Figure 1) (Appendix B).

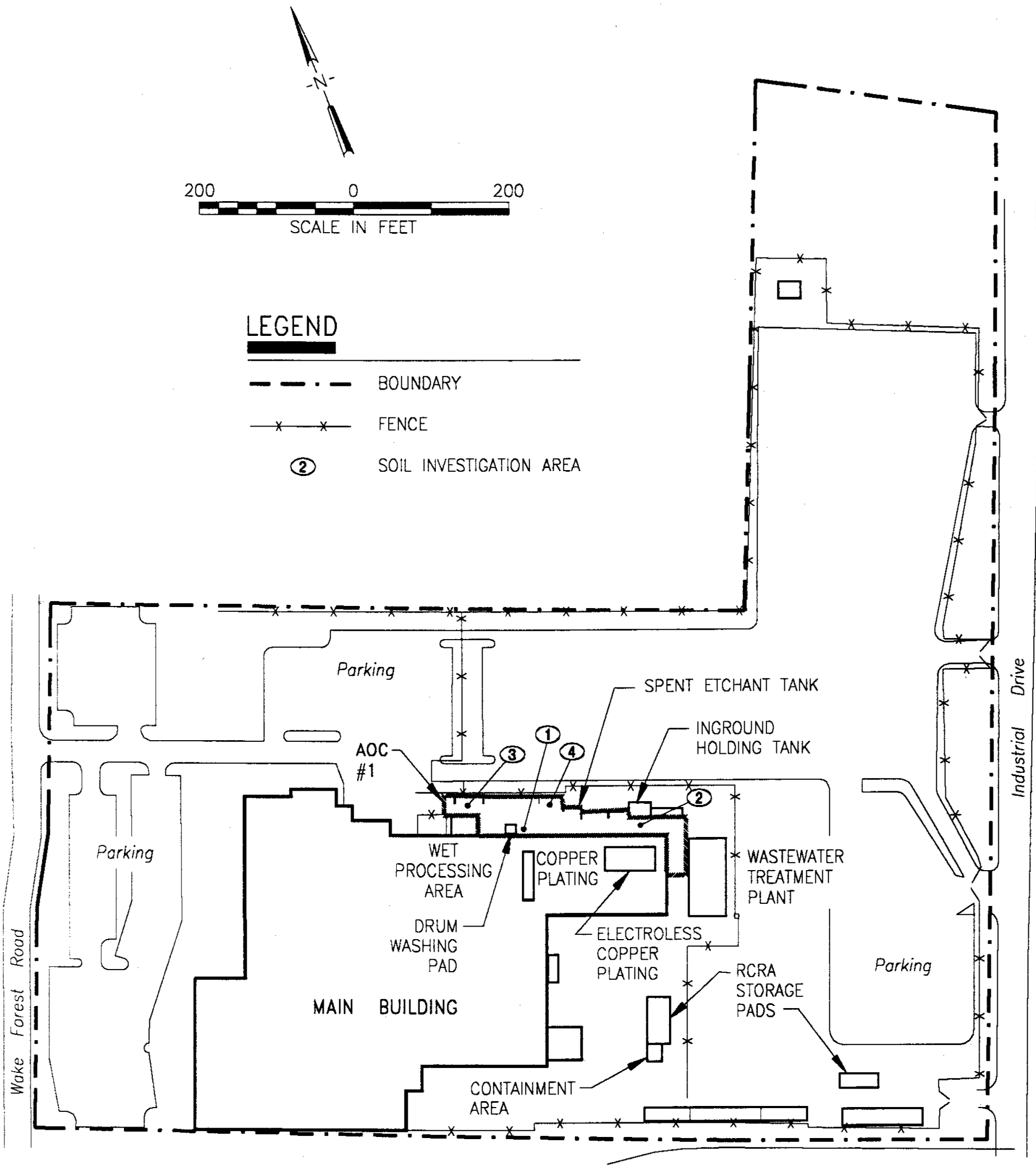
The facility property consists of 25 acres in an industrial park setting. The Keebler Company is several yards south and west of the Alcatel property line and the Holly Park Shopping Center lies just southwest of the facility. To the south and east is the Rural Plumbing Company. There are two schools within a one mile radius of the site and several residential communities have been identified within a half mile and to the northwest. The facility itself is comprised of a 235,000 square foot main building, two drum storage pads, sludge storage area, wastewater treatment plant, several warehouses and associated small structures (Figure 2). Alcatel has operated at this location since 1958 (Ref. 1).

2.2 FACILITY OPERATIONS/WASTE MANAGEMENT PRACTICES

Beginning in 1958 and continuing through the summer of 1990, Alcatel developed, manufactured, and marketed telecommunications transmission equipment for commercial telephone companies; marine communications and navigation equipment; satellite communications earth stations, and associated ground communications equipment.



CDM FEDERAL PROGRAMS CORPORATION **SITE LOCATION**	FIGURE NO
ALCATEL NETWORK SYSTEMS **RALEIGH, NORTH CAROLINA**	1



CDM FEDERAL PROGRAMS CORPORATION

SITE LAYOUT

ALCATEL NETWORK SYSTEMS

RALEIGH, NORTH CAROLINA

FIGURE

2

The facility is currently used for research and development and other administrative functions; manufacturing is no longer conducted at this location, however, the company has been engaged in the closure and refurbishment of areas of the main building where processing and manufacturing of components was conducted (Ref. 1).

A variety of chemical solutions were used in the manufacturing of printed circuit boards and in metal and finishing processes. As a result of these activities, Alcatel obtained a RCRA permit to store the following hazardous wastes on site (Ref. 2).

F001 Spent 1,1,2-Trichloro-trifluoroethane (Freon) and spent 1,1,1
F002 trichloroethane to be stored in 55-gallon containers. This is used to degrease printed circuit boards following soldering. 1,1,1 Trichloroethane was used in vapor degreasing and cold cleaning.

F002 Spent 1,1,1-Trichloroethane to be stored in 55-gallon containers. This material was used in vapor degreasing and cold cleaning.

F006 Dewatered metal hydroxide wastewater treatment sludge from electroplating operations.

D001 Used flux from soldering operations to be
D002 stored in 55-gallon containers. This is
D008 a flammable, corrosive water soluble blend of alcohol, glutamate polymer and water, contaminated with lead and tin.

D002 Spent tin/lead stripping solution stored in 55-gallon containers. This
D008 was used to etch tin/lead solder from printed circuit boards. It contains ammonia bifluoride, tin, copper and lead. A 6,000-gallon reinforced fiberglass tank was used in a process involving the removal of background copper deposits from circuit boards. The etchant material, heavily contaminated with copper was stored in the 6,000-gallon tank (SWMU #3). The material was subsequently returned to the supplier for reclamation. In 1988, the tank was assessed with regard to integrity under 40 CFR Part 264.191. The tank was found to be in excellent condition.

D002	Spent paint remover stored in 55-gallon containers. This contained methylene chloride, sodium hydroxide, and ammonia hydroxide.
F008	Electroplating sludges containing cyanide.
D001	Paint and paint thinner stored in 55-gallon
F005	containers.

The RCRA permit authorized storage of liquid hazardous wastes on two uncovered pads (SWMUs Nos 4 and 6), and the treatment of dewatered wastewater treatment sludge in a roll-off container on the sludge treatment container storage pad (SWMU No.5). Also, the manufacturing facility used a concrete sump compartmentalized into six sections to serve as holding tanks (SWMU #1). The holding tanks received tin, lead, copper, chromium, nickel mineral acids, caustics and ammonium biflouride from the conveyor lines. These tanks were closed and decontaminated following cessation of manufacturing operations in 1990.

The wastewater pretreatment plant (WWTP) treated 300,000 - 400,000 gallons per day (SWMU #2) of aqueous wastes from several sources. The primary source was the in-ground holding tanks for wastes from the assembly lines. Other influent sources were non-contact cooling/heating water, compressor drainage water and cooling tower water. Wastewater was acidic, containing low to moderate concentrations of heavy metals. Spent plating bath solutions were sometimes pretreated before being discharged to the on-site WWTP while plating baths containing cyanide (F008) were always pretreated before entering the WWTP. All treated effluent from the WWTP was discharged to the City of Raleigh (POTW) (Ref. 2). Dewatered metal hydroxide sludge generated from the wastewater treatment plant was stored in roll-off containers on a pad used exclusively for storage of solids (SWMU #5).

During the change in the facility's status from manufacturing to research and development/administration, wastes associated with the production of printed circuit boards were no longer generated. Contaminated soil, however, was detected in several areas along the facility's north alleyway (AOC #1). Remedial activities conducted at the

site included the excavation of contaminated soils determined to be hazardous that were transported to an off-site hazardous waste disposal facility. Groundwater encountered during the excavation was pumped to the wastewater treatment system. During this remediation period, Alcatel changed their name from Alcatel Network Systems Corporation to Alcatel NA Network Systems Corporation. The change of names occurred as a result of a reorganization of the corporate structure (Ref. 3).

2.3 REMEDIAL INVESTIGATIONS

Following is a brief discussion of the chronology of remedial investigations carried out at the site. A more complete discussion is included in Section 4.0.

November 1989 - The North Carolina Hazardous Waste Section was notified that Alcatel detected elevated levels of copper and lead in the soil near some underground piping. They were discovered while contractors were digging up existing asphalt and concrete. Two areas of discolored soil were noted (Ref. 4).

The first area was near the drum wash pad. This area classified as Area 1, had discolored soil to a depth of 4 feet below land surface (bls). The extent of the impacted soil reached an area measured at 185 square feet. The impacted soil was believed to have been caused primarily by a leaking joint in a two-inch diameter PVC spent copper etchant transfer line, running about two feet below the surface. It was pressure tested in 1988 and found to be intact, so contamination is expected to be minimal. Also a hairline fracture in the concrete pad located over this area may account for elevated metals.

The second area was 145 feet east of Area 1 (Figure 2). Soil discoloration was noted at a depth of 2.5 feet bls. Excavation went to eight feet. Several abandoned two- and four-inch chemical transfer lines were located in this area, which may be the source of contamination. Soil samples were found to be acidic, increasing the probability of leaching due to the increased mobility of metal ions under acidic conditions.

Groundwater was reached at six feet bls (Ref. 4). This shallow water table is a concern, considering the proximity of the contamination and the mobility of the metals.

February 1990 - Westinghouse Environmental and Geotechnical Services, Inc. (WEGS) submitted a work plan for the removal of soil from the contaminated areas. Between November 1989 and February 1990, a third area (area 3) contaminated with volatile organics was also discovered. Soils were excavated in February 1990 (Ref.4).

May and August 1990 - WEGS submitted a report summarizing the clean up of Areas 1 and 2, respectively. A more complete discussion is included in Section 4.0. Supporting documentation is identified in Appendices C and D.

October 1990 - National Environmental Technologies, Inc. (NET) installed four shallow groundwater wells; MWs 6,7,8 and 9. Well logs data and sampling results are included in Appendix E.

February 1991 - NET submitted the Phase I report summarizing the findings of groundwater and soil contamination. The purpose of this investigation was to further assess the environmental impact in the vicinity of Area 3 by doing additional soil borings, carrying out a soil gas survey and installing five additional monitoring wells (MW 1-5). The results indicated that although Areas 2 and 3 were identified as probable sources, an additional source may be present upgradient of MW 4. Although the majority of impacted soils were removed from Area 3, data collected indicated low levels of VOCs present in the immediate vicinity. These areas are further discussed in Sections 4.0 and 5.0 (Ref. 5).

March 1991 - Envirochem Environmental Services, Inc. (ECES) sampled a 30 x 60 foot asphalt drum storage pad (SWMU 4) by using a hand auger. All results indicate that contaminants are below regulatory limits or are not detectable (Ref. 6).

March 1991 - WEGS prepared an addendum to the clean up of Area 2, where the majority of soil was removed Feb/March 1990. Previous analyses indicated isolated contamination below the terra cotta pipe and between the sumps. The latest analyses indicate that the maximum concentration of leachable lead is ten times less than the toxicity limits and total lead is within the range of natural soils (2-200 mg/kg) (Appendix F).

June 1991 - WEGS prepared a report on Area 4 indicating that lead contamination was essentially limited to the top foot of soil and the overlying paving material. The area was sampled in April 1991 and the results are available in Appendix G. Removal of one foot of soil and the paving materials was recommended.

2.4 REGULATORY HISTORY

Alcatel owns and operates permitted hazardous waste storage facilities in Raleigh, North Carolina. The facility maintains three permitted storage areas: two drum storage pads with a combined capacity of 22,000 gallons and a storage pad for bulk solid waste with a capacity of 40,000 pounds.

The facility was managed under the name ITT Telecommunications Corporation (ITT) through July 9, 1987 when the name was changed to Alcatel Network Systems Corporation. ITT operated a hazardous waste storage facility under RCRA interim status from August 5, 1980 through August 5, 1983 when a final status permit was

granted. The permit was modified in November 1987 to include an updated closure plan, additional information on financial instruments and the name change to Alcatel. A final modified permit was issued to Alcatel on April 14, 1988. The permit remains in effect until August 5, 1993.

Two Compliance Orders have been issued to ITT and Alcatel over this period, both for failure to provide updated financial information. A more detailed accounting of Alcatel's regulatory history is presented below.

November 4, 1980 - ITT clarified information on previously submitted (August 5, 1980) Hazardous Waste Activity Notification forms (Ref. 2).

February 4, 1981 - ITT requested changes in Item IV of the Hazardous Waste Activity Notification forms (Part A) to reflect current regulations regarding hazardous waste designations (Ref. 7).

June 12, 1981 - NCDHR reported results of the RCRA Interim Status inspection. The inspection report cited a few minor violations.(Ref. 8).

August 5, 1983 - NCDHR issued Permit No. NCD003185238 to ITT for the storage of hazardous wastes (Ref. 9).

July 13, 1987 - NCDHR issued a Compliance Order with an Administrative Penalty, Docket No. 87-499 to ITT Telecommunications Products Corporation. The facility is cited for failure to adjust its closure cost estimate within the specified time frame. A civil penalty of $500 was assessed (Ref. 10).

August 6, 1987 - NCDHR requested a revised RCRA Part A application due to a name change from ITT Telecommunication Products Corporation to Alcatel Network Systems Corporation (Ref. 11).

August 20, 1987 - Alcatel submitted a revised RCRA Part A application to reflect the name change (Ref. 12).

November 6, 1987 - NCDHR issued a draft modified hazardous waste storage permit and initiated a public comment period.
(Ref. 13).

April 6, 1988 - Alcatel submitted amended copy of Form 3, Part A application to reflect changes in the regulatory descriptions of hazardous wastes (Ref.14).

April 14, 1988 - NCDHR issued final RCRA Permit No. NCD003185238-M1 to Alcatel for the storage of hazardous waste (Ref. 15).

July 26, 1988 - NCDHR issued Compliance Order with Administrative Penalty, Docket No. 88-255 to Alcatel. The facility is cited for failure to provide updated financial information. Alcatel is assessed a civil penalty of $2,500 (Ref. 16).

September 7, 1988 - NCDHR proposes to mitigate the civil penalty assessed under Compliance Order with Administrative Penalty, Docket No. 88-255 from $2,500 to $1,000 (Ref. 17).

November 3, 1989 - Alcatel notifies NCDEHNR of the discovery of elevated levels of copper and lead in the soil near some underground piping (Ref. 17).

March 2, 1990 - Alcatel submits a Work Plan to define the extent of solvent contamination. Excavation of soils believed to contain elevated levels of copper and lead continues (Ref. 18).

May 29, 1990 - NCDEHNR approves minor permit modification regarding name change from ITT to Alcatel Network Systems (Ref. 19).

October 18, 1991 - NCDEHNR approves name change from ITT to Alcatel Network Systems, Inc.

3.0 ENVIRONMENTAL AND DEMOGRAPHIC SETTING

3.1 TOPOGRAPHY AND DRAINAGE

The Alcatel facility is situated at an elevation of 240 feet above mean sea level (amsl) in topography that consists of maturely dissected upland terrain resulting in rolling hills with local relief ranging from 80 to 150 feet. Drainage forms a fairly dense network of dendritic patterns. Surface runoff exits the facility and flows southerly approximately 2300 feet along an unnamed ephemeral tributary to Crabtree Creek. Crabtree Creek flows southeasterly approximately 7.5 miles to its confluence with the southerly flowing Neuse River (APPENDIX B) (Ref. 2).

3.2 SOILS

Soils in the plant area are generally about 20 feet deep and underlain by bedrock. They are a residuum of granitic protolith and are typically soft to very dense, white to yellow brown, clayey to silty very fine sands. There is an abundance of mica particles and local abundance of coarse fragments and dark brown mottles. Sieve and hydrometer tests show the soils to be fine to medium sands. Generally, the soils are classed as ML and SM under the Unified Soil Classification System. The median grain sizes vary from 0.25 - 0.32 mm, liquid limits are 19-21 and natural moisture content is 8.9 - 14.2 percent by weight.

The soils are generally advanced to the point of having well developed B (clay) horizons to depths of four to five feet (Ref. 19).

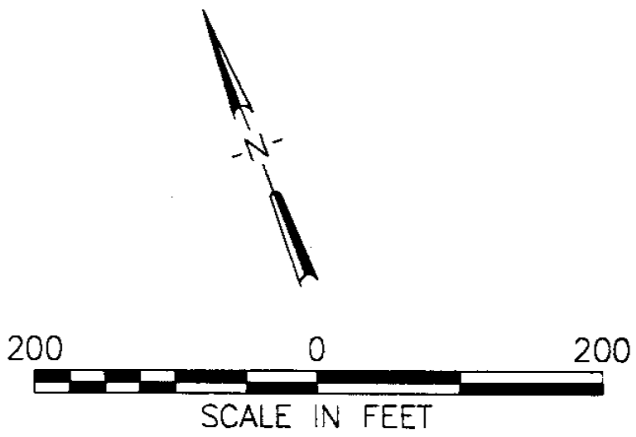
3.3 GEOLOGY

The Alcatel property is located within the Piedmont Physiographic Province Hydrogeologic Region in an area underlain by a precambrian to early Paleozoic pegmatite gneiss injection complex. Locally the complex consists predominately of fine to medium grained, well graded mica gneiss with layers of mica schist and hornblende gneiss commonly interspersed. The metamorphic assembledge is cut by numerous pegmatite dikes and granitic stringers displaying conformable and discordant intrusion with sharp and gradational contacts. Massive foliations are commonly contorted and faulted and shear zones are often striated parallel to the resultant transport direction (Ref. 19 and 20).

3.4 HYDROGEOLOGY

Alcatel carried out a groundwater impact investigation in 1990 through National Environmental Technical Inc. (NET) in the vicinity of the wastewater equalization basin. Four groundwater monitoring wells were installed upgradient and downgradient of the basin. Well locations are shown in Figure 3. Three of the wells , MWs 6,7, and 8, were located 20-30 feet downgradient and MW 9 was installed 50 feet upgradient of the basin. Each of the wells were screened within the top ten feet of the aquifer and averaged a total depth of about 20 feet. Wells are constructed of two-inch diameter PVC with ten feet of 0.01 inch slotted screen. Filter packs, bentonite seals and concrete collars were used. Wells were purged with three volumes and allowed to recover before sampling. Well logs are included in Appendix E.

Shallow groundwater beneath the facility occurs under phreatic (water table) conditions and resides within the primary pore spaces and residual structure retained in the saprolite overburden. Deeper groundwater is found in secondary openings of the hard



LEGEND

BOUNDARY

FENCE

MONITORING WELL

CDM FEDERAL PROGRAMS CORPORATION

MONITORING WELL LOCATIONS

ALCATEL NETWORK SYSTEMS

RALEIGH, NORTH CAROLINA

FIGURE N

3

rock complex formed by faults, joints, foliations and adiabatic recession of cooling hydrothermal injections. This residual saprolite/fractured rock aquifer system is recharged primarily through infiltration of direct precipitation which percolates vertically into the fracture network at a rate controlled by compaction and clay content of the soil mantle. Although the residual saprolite and the underlying fractured rock are hydraulically connected, the variable nature of vertical migration conduits in such a system often results in deeper fracture controlled groundwater existing under semiconfined or even confined conditions (Ref. 19 and 20).

The depth to groundwater is approximately 12 feet bls. Water table elevations are lowest in September and October due to low infiltration. Shallow groundwater exhibits horizontal flow generally to the southwest.

It should be noted that groundwater flowing in the fractured rock portion of the aquifer system is not restricted to the topographically influenced gradient of the shallow water table. Rather, groundwater in fractured rock aquifers is obliged to flow along trends of the secondary openings, which accommodate storage and serve as transmission conduits. Accurate knowledge of the paths of all secondary openings in a fractured rock aquifer is not practically attainable with our present technology. This dictates that deeper groundwater flow in fractured rock aquifer systems is virtually unpredictable and technically capable of migrating in any of the numerous compass directions that correspond to the trends of the secondary openings (Ref. 22).

6, 7, 8 ? cross check

Wells 1, 2 and 5 were used for slug testing, where the mean was determined to be 3.99 feet/day. The calculated hydraulic gradient was 0.017 and the calculated seepage velocity was 0.22 feet/day (Ref. 19).

The results of well sampling indicated that no VOCs were present. Total metals tended to be slightly higher in the background well (possibly due to the higher suspended solids).

3.5 METEOROLOGY

Rainfall in the region averages 41.76 inches per year (Ref. 21).

3.6 WATER SUPPLY

Surface water is the major source of potable supplies for the City of Raleigh. The City of Raleigh Public Utilities Services received its water from Falls Lake Reservoir, located 16 miles north from downtown Raleigh. The lake is used for fishing, swimming, boating, and other recreational activities. The intake from the utility system is 0.75 miles upstream from the dam along the Neuse River. The city's filtration/treatment plant is located three miles south of Falls Lake along Falls Neuse Road and processes 36 million gallons per day. The utility system serves approximately 70,000 residential connections and 5,000 nonresidential connections (Ref. 22).

Several residents within three miles of the Alcatel facility obtain potable water from private wells. The number of residents in the area using private wells is unknown, however, the average depths of private wells ranges from 40 to 200 feet bls. A private well survey of the area was not conducted during the RFA (Ref. 23).

4.0 VISUAL SITE INSPECTION

4.1 SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREA OF CONCERN (AOC)

This section presents SWMU and AOCs Data Sheets, completed to provide descriptions and release assessments of the SWMUs and AOC identified during the Alcatel facility inspection.

Seven SWMUs and one AOC were identified during the VSI. The units identified include the in-ground holding tanks, wastewater treatment plant, spent etchant tank, drum washing pad, RCRA storage pads numbers 1 and 2, and sludge containment pad. The AOC identified was the process effluent, drainage system alleyway. The location of the SWMUs and AOC are identified on Figure 4 and further delineated on Table 1, assessment summary.

In the SWMU and AOC data sheets, the following designations are used to assess the potential for release to the environment via the various pathways.

L (Low) - minimal potential for release
M (Medium) - moderate potential for release
H (High) - evidence suggests that releases have occurred
U (Unknown) - no information is available

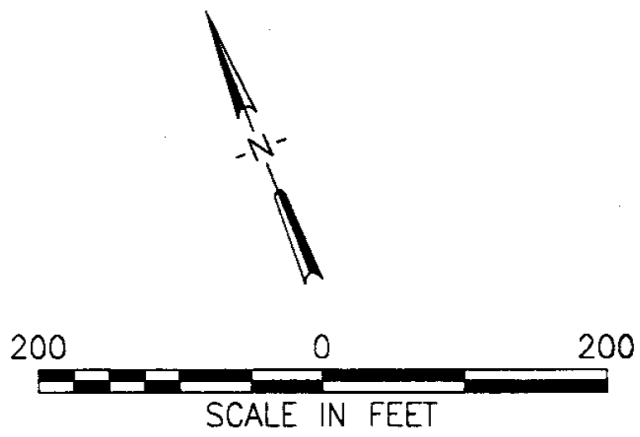
TABLE 1
ALCATEL NETWORK SYSTEMS
SWMU/AOC ASSESSMENT SUMMARY

AOC/ SWMU NO.	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	(1) POLLUTANT MIGRATION PATHWAYS	EVIDENCE OF RELEASES	(2) RELEASE POTENTIAL	(3) RECOMMENDATION		
							RFI	PHASE 2 SAMPLING	NO FURTHER ACTION
1	Inground Holding Tanks	1980–1990	Tin, Lead, Copper Chromium, Nickel Mineral Acids and Caustics Ammonium, Bifluoride	A SW S GW SBG	Unk No No No No	L L L L L			X
2	Waste Water Treatment Plant	1979–1990	Tin, Lead, Copper Chromium, Nickel Mineral Acids and Caustics Ammonium, Bifluoride	A SW S GW SBG	Unk Unk Unk Unk Unk	L L L L L			X
3	Spent Etchant Tank	1981–1990	Spent Copper Element	A SW S GW SBG	Unk Unk No No No	L L L L L			X
4	RCRA Drum Storage Pad #1	1981–1990	1,1,1 – Trichloroethane Alcohols, Spent Freon, Spent Paint Remover, Petroleum Based Oil Flux, Flux Thinner, Tin Lead, Copper	A SW S GW SBG	Unk Unk Yes No No	L L M M L			X
5	Sludge Containment Pad	1982–1991	Dewatered Metal Hydroxide Sludge, Tin, Lead, Copper,Iron, Chromium, Zinc Aluminum, Nickel	A SW S GW SBG	Unk Unk Unk Unk Unk	L L L L L			X
6	RCRA Drum Storage Pad #2 Area	1982–Present	Alcohol–Based Flux, Spent Freon, Spent Trichloroethane, Spent Paint Thinner	A SW S GW SBG	Unk Unk Unk Unk Unk	L M M M L			X
7	Drum Washing Pad	1980–1990	Caustics, Copper, Tin Lead	A SW S	Unk Unk Yes	L M M			X

TABLE 1
ALCATEL NETWORK SYSTEMS
SWMU/AOC ASSESSMENT SUMMARY

AOC/ SWMU NO.	TYPE OF UNIT	YEARS IN OPERATION	WASTES MANAGED	(1) POLLUTANT MIGRATION PATHWAYS	EVIDENCE OF RELEASES	(2) RELEASE POTENTIAL	(3) RECOMMENDATION		
							RFI	PHASE 2 SAMPLING	NO FURTHER ACTION
AOC	Process Effluent Drainage System/ Alleyway	1978–1990	Tin, Lead, Copper, Chromium Nickel, Spent Copper Etchant, Mineral Acids and Caustics, Ammonium Bifluoride	A SW S GW SBG	Unk Unk Yes Yes Yes	L M M M M		X	

1 – A designates air, SW designates surface water, S designates soil, GW designates ground water and SBG designates subsurface gas.
2 – L designates a low, M designates a moderate and H designates a high exposure potential. See SWMU description for substantation.
3 – Recommendation check (X) denotes the recommendation for the AOC.



LEGEND

BOUNDARY

FENCE

SOLID WASTE MANAGEMENT UNITS

1. INGROUND HOLDING TANK
2. WASTEWATER TREATMENT PLANT
3. SPENT ETCHANT TANK
4. RCRA DRUM STORAGE PAD #1
5. SLUDGE CONTAINMENT AREA
6. RCRA STORAGE PAD #2
7. DRUM WASHING PAD

AREA OF CONCERN

◇1 PROCESS EFFLUENT DRAINAGE SYSTEM/ALLEYWAY

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SOLID WASTE MANAGEMENT UNITS & AREA OF CONCERN

ALCATEL NETWORK SYSTEMS

RALEIGH, NORTH CAROLINA

FIGURE N

4

SWMU Number: I **Photo Numbers:** 1,2,3

NAME: In Ground Holding Tanks

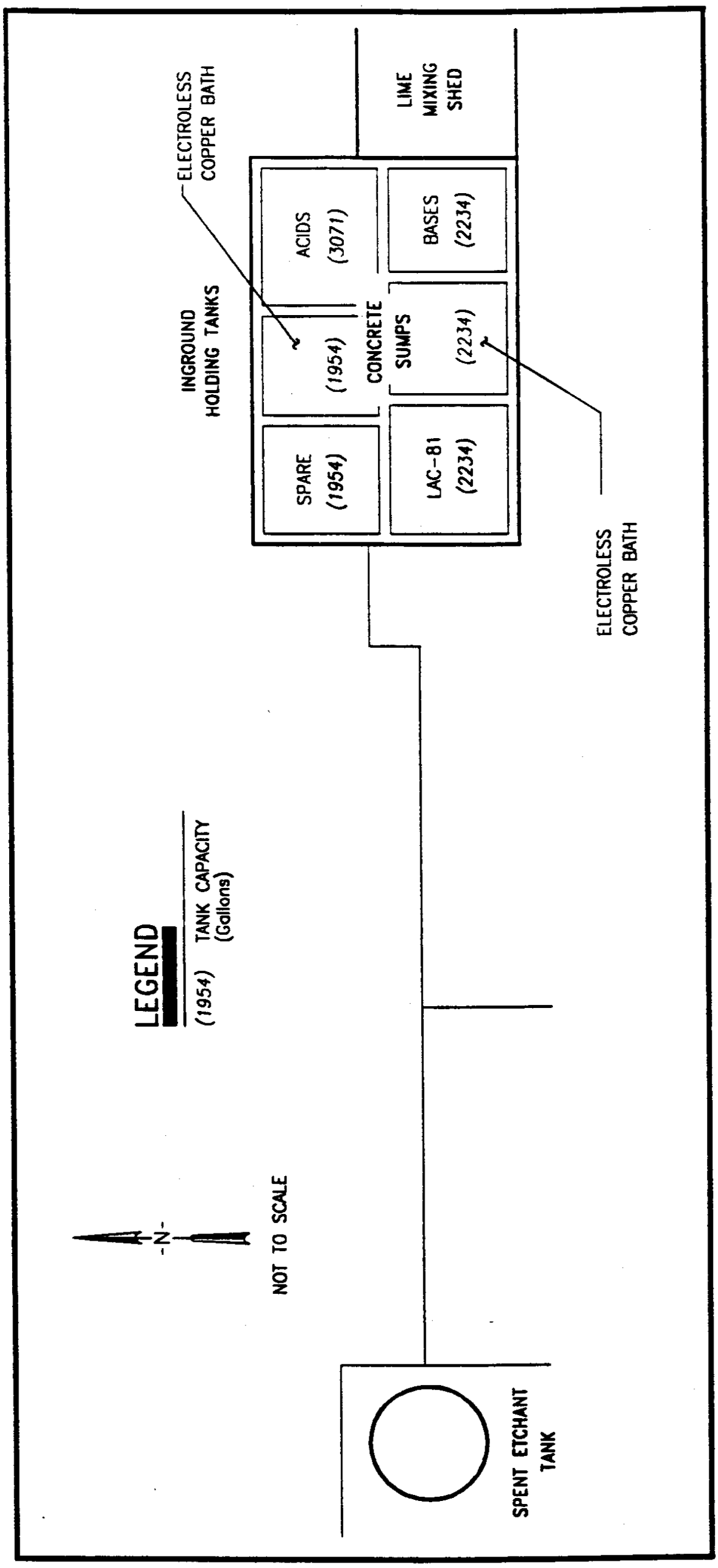
TYPE OF UNIT: Holding Tank

PERIOD OF OPERATIONS: 1980 - 1990

Physical Description and Condition: The holding tanks located northeast of the main building are bounded by the wastewater treatment plant to the east, the old drainage system to the south, the storage shed to the west, and an earthen embankment to the north (Figure 5). The holding tank area consisted of a rectangular 34 feet long by 20 feet wide by 6 feet deep concrete sump compartmentalized into six enclosed sections. Each section is concrete walled and custom fitted with PVC liners.

Six 4-inch gravity fed PVC pipes emptied assembly line waste into each section for temporary storage. All stored wastes eventually were pumped to the wastewater treatment plant on site.

In 1988, Alcatel redesigned the tank areas: The PVC liners and pipes were removed and sent to GSX for final disposition. Concrete walls were sandblasted, holes from the pipe entrances plugged with concrete, a graphite reinforced vinyl ester was used to coat the walls, and six 1-inch thick walled polypropylene tanks within a stainless-steel cage were placed separately in each section. A plastic grating was placed on top of each section for easy viewing access, and a 3-sided roofed structure was built over the area protecting the sump from outside precipitation. The tank capacities range from 1,700 to 2,600 gallons, and the opened end of the roofed structure faces toward the south. Four pipes replaced the PVC pipes that pumped wastes overhead from process areas to the tanks.



CDM FEDERAL PROGRAMS CORPORATION

SPENT ETCHANT TANK & INGROUND HOLDING TANK LAYOUT

ALCATEL NETWORK SYSTEMS

RALEIGH, NORTH CAROLINA

FIGURE NO.

5

Alcatel closed its circuit board and waste operations from July to October, 1990. The closure of the tank area consisted of decontaminating the tanks, steel cages, and concrete with a high temperature, high pressure wash, crushing the PVC pipes and sending them to GSX, and selling the tanks to an undisclosed party. All liquid wastes generated from the closure were sent to the on-site WWTP.

During the VSI, personnel observed that the concrete sump tanks were removed, the concrete walls appeared solid and intact, and the 3-sided shelter appeared in good structural condition.

Wastes and/or Hazardous Constituents Managed: The holding tank area received the following wastes from the conveyer lines: tin, lead, copper, chromium, nickel, mineral acids, caustics, and ammonium bifluoride. The acids and caustics collected from the manufacturing process were not classified as "hazardous by characteristic," according to plant personnel, however, those wastes with high/low pH concentrations were directed to a treatment tank.

Release Pathways: Air (L) Surface Water (L) Soil (L)
Groundwater (L) Subsurface Gas (L)

History and/or Evidence of Releases: In February 1990, Westinghouse Environmental and Geotechnical Services (WEGS) conducted a sampling investigation at Alcatel at areas suspected to be contaminated. Six subsurface composite soil sample were collected at intervals of 3, 6, 9, and 12 feet near the in-ground tank area to determine if the tanks were sources of contamination from spills or leaking pipes. At this area (refer to Figure 7, Area 2), copper was detected in concentrations ranging from 1.03 mg/L to 2.4 mg/L and lead was detected in ranges from 0.055 mg/L to 2.96 mg/L.

Alcatel, as a result of these findings, conducted remedial activities to remove impacted soils. The remedial activities consisted of excavation and subsequent landfill disposal of

impacted soils. A total of 277 tons of soil from Area 2 and areas identified in the Area of Concern in this report, have been excavated and disposed of at GSX Services in South Carolina. Groundwater encountered during the excavation of soils in this area was pumped to the facility's wastewater treatment plant.

Recommendations: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

References: 1, 24, 25

Comments: Alcatel has installed a network of groundwater monitoring wells as a part of the groundwater quality assessment.

SWMU Number: 2 **Photo Numbers:** 4, 5, 6, 7

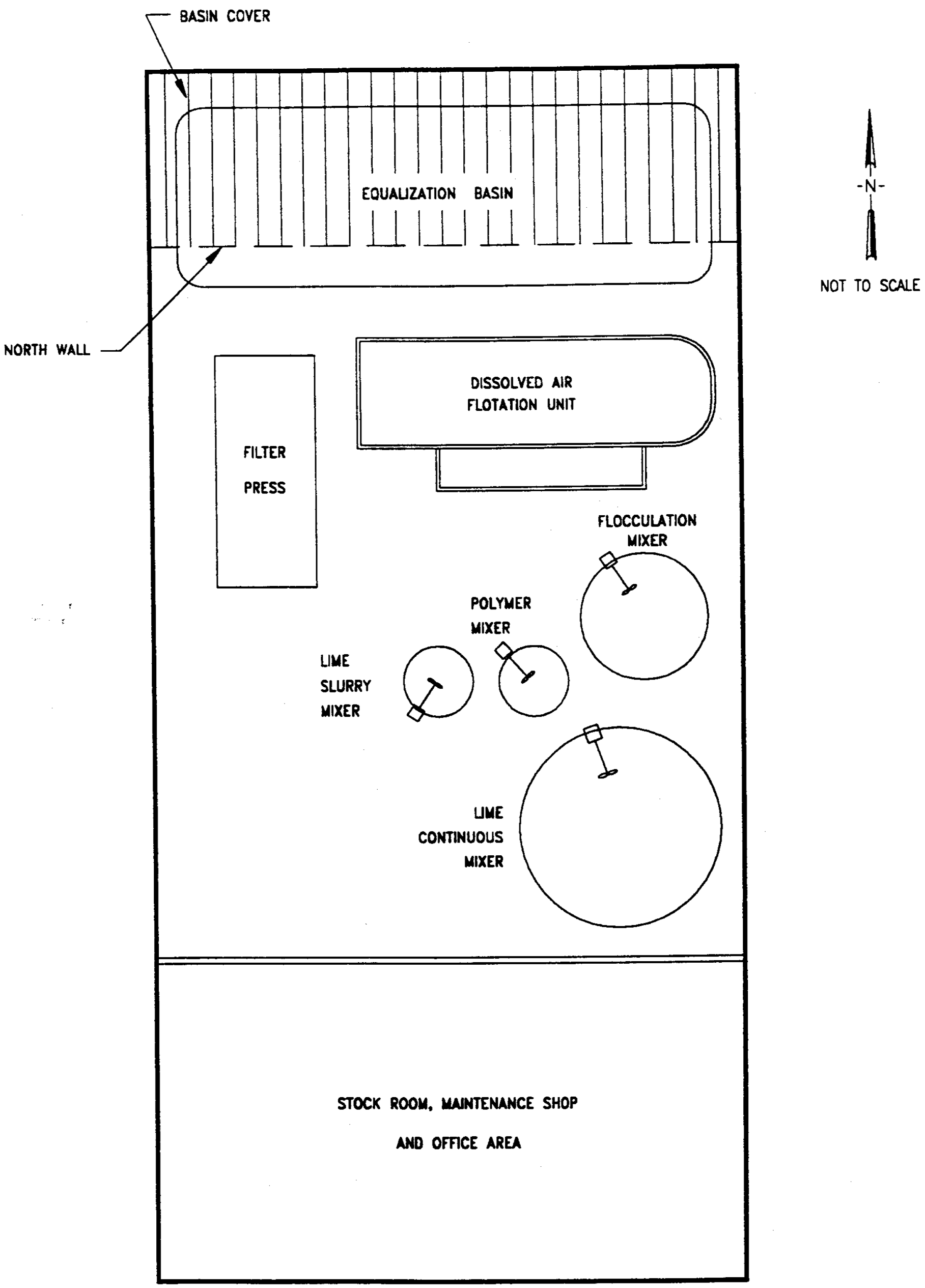
NAME: Wastewater Treatment Plant

TYPE OF UNIT: Waste Treatment

PERIOD OF OPERATIONS: 1979 - 1990

Physical Description and Condition: The wastewater treatment plant (WWTP) occupies 3,563 square feet which includes the underground equalization basin in the northeastern corner of the facility (Figure 6). The WWTP was comprised of a series of tanks, basins, filter press, mixers and treatment components used to separate, stabilize, and neutralize wastes into manageable components. The entire treatment process area was housed within a metal two-story roofed building with equalization basin, clarified water basin, and sludge basin, (total basin capacity of 262,000 gallons), underneath the 3-inch concrete floor. All basins and in-ground tanks were constructed of concrete, and were coated with impermeable materials. When Alcatel closed all the assembly lines in 1990, the WWTP was closed and converted to a storage area for office equipment with the equalization basin, clarified water basin, and sludge basin converted to chilled water holding basins. Most of the wastewater treatment equipment was dismantled and shipped off to Payson Associates, Inc. in Southfield, Michigan. No evidence of spills, leaks, stains, cracks or structural damage was observed inside or outside the building and all concrete structures were in sound condition.

During Alcatel's past assembling operations, the WWTP received aqueous wastes from several sources. The primary source was the in-ground holding tanks that stored wastes originating from the assembly lines. Other nonhazardous effluent directed to the treatment unit were noncontact cooling/heating water, compressor drainage water, and the cooling tower water. Approximately 350,000 gallons of water was processed per day. Depending on the waste concentration, water was either directed to the



CDM FEDERAL PROGRAMS CORPORATION

WASTEWATER TREATMENT PLANT LAYOUT

ALCATEL NETWORK SYSTEMS

RALEIGH, NORTH CAROLINA

FIGURE NO.

6

equalization basin or the holding tanks. Aqueous wastes with small concentrations were sent to the equalization basin for storage and later pumped to the lime contact basin to raise the wastes' pH and flocculent formation. Wastes were directed to a dissolved air flotation tank where sludge was skimmed off and pumped to a sludge basin. Remaining water was sent through the filtration system for discharge or redirected to the equalization basin. The sludge from the basin was directed to a filter press for compression into a greenish/blue brick. The solid content of the brick was approximately 40-50 percent (solids by weight). The bricks were placed in roll-off containers (SWMU No. 5) and disposed of at GSX in Pinewood, South Carolina.

Aqueous wastes with high/low Ph concentrations were stored in the holding tanks and sent to an acid/base treatment tank. The wastes were neutralized and the consistency thickened to a sludge like material. The material was pumped to the sludge basin and remaining water sent to the filtration system or the equalization basin. The electroless copper bath wastes were pumped to treatment tanks to raise the wastes' pH with ferrous sulfate lime. Sludges were sent to the sludge basin. All pretreated wastewater effluent was discharged to the City of Raleigh POTW in compliance with City, State, and Federal water quality effluent standards. Inside the treatment building, trenches outlined the equipment directing all effluent to the equalization basin.

Wastes and/or Hazardous Constituents Managed: The WWTP received the following waste from manufacturing processes for treatment: tin, lead, copper, chromium, nickel, mineral acids, caustics, and ammonium bifluoride. All rinse waters originated from Alcatel's assembly lines. The acids and caustics collected from the manufacturing process were not classified as "hazardous by characteristic," according to plant personnel, however, those waste with high/low Ph concentrations were directed to a treatment tank.

Release Pathways: Air (U), Surface Water (L), Soil (L) Groundwater (L Surface Gas (U)

History and/or Evidence of Releases: No evidence of releases was identified in the available file material or the VSI. During the closure of the assembly lines and waste process operations, Alcatel contracted National Environmental Technologies, Inc. to install four permanent monitoring wells for periodic sampling. On October 17 and 18, 1990, three wells (MW-5, MW-7, MW-8) were installed 20-30 feet downgradient of the WWTP and one well (MW-9) 50 feet upgradient of the WWTP. Depths range from 19-23 feet bls. Testing of the groundwater samples, analyzed for purgeable organics, isopropyl alcohol, total chromium, copper, zinc, tin, and lead, revealed no constituent contamination (see Appendix D). Wipe samples of the equalization basin also revealed no contamination.

Recommendations: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

References: 1, 5, 26

Comments: Alcatel has installed a network of groundwater monitoring wells as a part of the groundwater quality assessment, and has implemented a groundwater sampling program.

SWMU Number: 3 **Photo Numbers:** 8

NAME: Spent Etchant Tank

TYPE OF UNIT: Tank

PERIOD OF OPERATIONS: 1981 - 1990

Physical Description and Condition: The spent etchant tank, located 15 feet north of the main facility, was a 6,000-gallon aboveground tank set within a reinforced concrete structure (**Figure 5**). The containment structure was bounded by the tank holding area to the east, the alleyway to the south, a storage shed to the west, and an earthen embankment to the north. The reinforced fiberglass tank received spent copper etchant through an underground 2-inch diameter PVC pipe. The pipes extended from the wet processing area inside the main facility building. Fresh etchant was pumped along the conveyer belt line to remove copper deposits from the circuit boards. At the end of the closed system, the spent copper etchant was pumped to the tank for storage. Approximately 120,000 to 225,000 pounds of spent etchant were generated annually. All etchant waste was sent to the supplier for reclamation and recycling.

A visual inspection and core sampling were performed On January 6, 1988 by Engineering-Science, Inc. on Alcatel's spent etchant tank and piping, to fulfill RCRA tank assessment requirements. The assessment confirmed the structural integrity of the tank, containment structure, and PVC underground inlet piping.

When Alcatel closed the circuit board and waste operations, the company decontaminated the tank with a high pressure/high temperature wash, and transported the tank to GSX in Pinewood, South Carolina.

All underground piping associated with the tank was removed during 1989. Presently, the concrete containment structure is solidly intact with a few items temporarily stored in the area. No spills or stains were observed on the concrete inside or outside the concrete structure.

Wastes and/or Hazardous Constituents Managed: The etchant tank only received spent copper etchant from the wet processing area. Spent etchant consisted of ammonium hydroxide and ammonium chloride with traces of copper waste from the circuit boards.

Release Pathways: Air (U), Surface Water (L), Soil (L), Groundwater (L), Subsurface Gas (U).

History and/or Evidence of Releases: In October 1989, Alcatel began construction of a storm water collection system in the alleyway in conjunction with closing the company's circuit board production lines. The concrete and asphalt covering were removed which uncovered an area of discoloration (Area No. 1, Figure 8) next to and partially underneath the drum washing pad. Initial sampling of Area 1 confirmed the presence of lead and copper, but did not reveal any quantitative measurement of the contaminants. The suspected sources for the contamination were a leaking joint in a 2-inch PVC spent copper etchant line from the spent etchant tank, running underground through the area, and a hairline crack in the drum washing pad. Excavation of the area began and was completed before February 9, 1990. Approximately 20 tons of soil were removed and transported offsite by Williams Trucking Company, Inc. to GSX landfill in Pinewood, South Carolina. The finished excavated area was approximately 185 square feet and dug to a depth of 4 to 5 feet bls. The boundaries of the excavated area were determined by field analysis where once soils approached background levels, the excavation activities ceased.

Recommendations:
No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

References: 1, 4, 25

Comments: Alcatel has installed a network of groundwater monitoring wells as a part of the groundwater quality assessment, and has implemented a groundwater sampling program. Soils in Area No. 1 were excavated and sampled to clean (background) levels. No further action is recommended for the unit.

SWMU Number: 4 **Photo Numbers:** 9, 10

NAME: RCRA Drum Storage Pad Number 1

TYPE OF UNIT: Hazardous Waste Storage Unit (Drums)

PERIOD OF OPERATIONS: 1981 - 1990

Physical Description and Condition: Drum storage pad number 1 is a sloped asphalt pad that was used for storing 55-gallon drums containing liquid hazardous wastes. The pad, measuring 58 feet by 28 feet, is located in the eastern portion of Alcatel's property, 65 feet west from the main building (Figure 4). The pad's designed storage capacity was 336 drums with allowances for 280 square feet for aisle space. The pad is surrounded on three sides by an asphalt curb constructed to a height of nine inches. The pad's northern corner was designed as a liquid holding area that has a capacity of 2,000 gallons. The grade, directed away from the open side of the pad, was constructed to direct surface water toward a drainage valve in the northern corner. When surface water was collected on the pad, the drainage valve was opened only after an inspection by facility personnel of the drums revealed no leaks or spills. Surface water would be released onto grassy terrain that gently sloped towards an asphalt paved road and into storm drains. All drums were covered with plastic when stored on the pad as no roof was constructed. Past maintenance of the pad consisted of repaving the pad every two years. The asphalt thickness varied from 3.5 - 5 inches. During the pad's period of operation, no fence ever encircled the pad, but facility personnel were required to direct all visitors away from the pad.

During the VSI, inspection personnel noted that the pad was marked off prohibiting entry. Asphalt-filled boreholes were observed on the surface of the pad which marked the sampling investigation conducted by Envirochem Environmental Services, Inc. in February 1991. No drums were present during the VSI and no leaks, stains or residual material were observed on the pad or drainage area.

Wastes and/or Hazardous Constituents Managed: The RCRA drum storage pad was used to store 55-gallon drums containing liquid wastes. These wastes generated at the facility were solvents such as trichloroethane, alcohols, spent freon, spent paint remover, and other organic wastes. Spent trichloroethane was generated from the following operations: vapor degreasing of aluminum and steel parts; printed circuit board cleaning; cable degreasing; and cold cleaning. The spent solvent was also contaminated with water, oils, aluminum and steel shavings, dirt, glue components, and clean grease. Freon, used to degrease printed circuit boards, was contaminated with petroleum based oil, flux, flux thinner, water, dirt, and trace amounts of tin and lead. Approximately 11 tons of spent trichloroethane and freon (F001 and F002) were generated annually. The silk screening room generated 150 gallons of spent paint remover (D002) annually. Spent tin/lead stripping solution, generated from the stripping of tin/lead solder from printed circuit boards, consisted of ammonium bifluoride, dissolved tin, copper, and lead. All spent trichloroethane and freon was sent to a TSD recovery facility, and all spent paint remover and tin/lead stripping solution was sent off site for disposal.

Release Pathways: Air (L), Surface Water (L), Soil (M), Groundwater (M), Subsurface Gas (L).

History and/or Evidence of Releases: In 1983, 2-3 gallons of tin/lead stripper solution leaked from a 55-gallon drum. The leak was stopped, and sodium bicarbonate was used to neutralize the acidic waste. All residue was washed off the asphalt into the sump and sent to the on-site WWTP.

A soil sampling investigation conducted by Envirochem Environmental Services, Inc. at the request of Alcatel occurred at the RCRA storage pad during February 26-27, 1991. A sampling grid was established consisting of six rows of three samples each with 10 feet of spacing between each sample. A mechanized auger was used to bore through the asphalt for soil collection. One composite sample would consist of mixing three grab samples collected 1 foot bls, from one grid row. Besides the six composite samples, one composite soil sample was collected from grassy terrain along the drainage pathway and

another composite sample from the asphalt cuttings from each borehole. Analyses for TCLP metals extracted showed all samples below the detection limits (see Appendix E).

Recommendations: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

References: 1, 6, 8, 9, 13

Comments: Since conducting the RCRA Facility Assessment, Closure certification and inspection has already been received for this unit and no further action is anticipated. Alcatel closed the RCRA storage pad number 1 permanently. The asphalt is to be removed and landscaping will replace the area. See Section 5.0, Table 3, Sample Strategy.

SWMU Number: 5 **Photo Numbers:** 11, 12

NAME: Sludge Containment Pad

TYPE OF UNIT: Concrete Pad/Roll-Off Sludge Containers

PERIOD OF OPERATIONS:

Physical Description and Condition: The sludge containment area adjacent to the southern end of RCRA storage pad number 1 (SWMU No. 4) was a concreted area for the placement of two metal roll-off sludge containers (Figure 4). The sludge containment pad is a RCRA regulated unit. The concrete pad, measuring 25 feet by 20 feet, was constructed for the exclusive storage of solids generated from the wastewater treatment plant. The pad was not designed with spill retention barriers, however, the pad is slightly sloped to the southwest to prevent surface water pooling. Surface water was directed towards grassy terrain west and south of the pad. The pad's thickness is a minimum of six inches of concrete, and the design capacity was established for 200 pounds per square foot.

The metal roll-off sludge containers, Galbreath Models SR-TH-2048, stored dewatered metal hydroxide sludge cake from the WWTP. The dimensions of one metal container were 20 feet by 7 feet by 4 feet with a maximum holding capacity of 20.7 cubic yards. Both metal containers were reinforced with leak-free welding and gasketed openings. A heavy mil plastic liner was suspended inside the containers for cleaner maintenance and spill prevention. The Galbreath model container was also designed with a 6-inch clearance for easy recognition of leaks or spills from the bottom of the unit.

When Alcatel closed its circuit board operations, the company sold the roll-off sludge containers and utilized the sludge container area for nonhazardous solid waste container storage. During the VSI, inspection personnel observed several open top metal nonhazardous waste containers placed on or near the pad. Refuse consisted of paper and miscellaneous non-putrescible trash. The concrete pad was observed with no visible cracks or damage. No stains or discolored soil was observed near the area indicating that no leakage from the units occurred during the active period of sludge storage.

Wastes and/or Hazardous Constituents Managed: The metal roll-off sludge containers were designed to hold dewatered metal hydroxide sludge originating from the WWTP. The sludge designated RCRA F006 wastewater treatment sludges from electroplating operations was filter pressed into bluish-green bricks. When delivered to the metal sludge container, the bricks' consistency was approximately 40-50 percent solid by weight. The waste was acidic in nature and was comprised of copper, tin, lead, iron, zinc, chromium, aluminum, and nickel.

Before facility personnel placed the bricks into the containers, workers would pour in 150-200 pounds of kaolin to absorb excess water. This amount of kaolin utilized was required to absorb 18-24 gallons of water. Other procedures employed to reduce the water buildup was to open the top of the sludge container covers to induce solar evaporation.

During the operations of the WWTP, approximately 300 cubic yards of sludge bricks were generated annually. One container was filled every 3.5 weeks and sent to GSX landfill in Pinewood, South Carolina for disposal, while the other container remained onsite.

Release Pathways: Air (L), Surface Water (L), Soil (L) Groundwater (L), Subsurface Gas (U).

History and/or Evidence of Releases: According to plant personnel, no release of material either in solid or liquid form was ever observed or identified during the operational period of these units. A review of available file material and close up observation of the pad and surrounding area confirmed this finding.

During the periods when the tops of the units were left opened to promote evaporation of the liquids released from the waste bricks, no air testing or sampling was initiated for aerosol analysis, dispersion patterns or impact on the surrounding environment. The opening of the tops was a rare occurrence and potential environmental impact is

considered very low. No soil samples were collected from the limited soil area between the containers and main building to the west.

Recommendations: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

References: 1, 6

Comments: No further action is recommended for this unit.

SWMU Number: 6 **Photo Numbers:** 13, 14, 15, 16

NAME: RCRA Storage Pad Number 2

TYPE OF UNIT: Concrete Storage Pad

PERIOD OF OPERATIONS: 1982 - Present

Physical Description and Condition: RCRA storage pad number 2, located in the southeastern corner of the facility property, is a concrete pad used for the temporary storage of 55-gallon drums containing hazardous wastes (Figure 4). The pad, measuring 53 feet by 19 feet, is set against an earthen embankment with a surrounding 22 inch retaining wall preventing surface water run-on. The pad slopes toward a locked drainage valve in the northwestern corner of the pad. The 22-inch retention wall, and two 9-inch walls on the east and west sides of the pad create a 1,125 gallon capacity liquids holding area. Releases of accumulated surface water from the pad only occur after an inspection of the drums reveal no leaks or spills. Drainage from the valve runs along a small grassed drainage ditch then disperses out onto the property. A culvert also runs underneath the concrete pad to direct upgradient precipitation beneath the pad. The storage unit does not have a protective, wet weather cover.

The concrete pad has an elevated ramp along the pad's entire southern side to accommodate a forklift. The southern side faces an asphalt road where forklifts can easily deliver and remove drums. The pad, which has a storage capacity of 176, 55-gallon drums, is completely encircled by a fence. During the VSI, inspection personnel noted that all gates along the forklift ramp were locked. The pad's concrete floor is a minimum of six inches thick and is constructed to support more than 200 pounds per square foot.

During the VSI, FPC personnel observed 12 drums set on wooden pallets present in the storage unit. The drums were inventoried as follows: 5 drums of flux (D001), 3 drums of spent freon, 1 drum of paint thinner (D003), 2 drums of trichloroethane, and 2 drums of

lube oil (non-RCRA waste). All concrete fixtures appeared in solid condition. No leaks, stains, or spills were observed.

Wastes and/or Hazardous Constituents Managed: The RCRA storage pad number 2 is used for the storage of 55-gallon drums containing hazardous wastes. The wastes, generated from various sources, usually consist of solvent and organic chemicals: spent 1,1,1-trichloroethane, spent freon, spent paint thinner, and alcohol-based flux. Other spent chemicals exempt from RCRA requirements are stored on the pad. RCRA storage pad number 2 is the only active hazardous waste storage area on site.

Release Pathways: Air (U), Surface Water (M), Soil (M), Groundwater (M), Subsurface Gas (U).

History and/or Evidence of Releases: No evidence of releases was documented in the available file material; however, the release valve has been opened to discharge accumulated surface water. Although no leaks and/or spills have been reported, the potential for a release of residual hazardous waste materials without benefit of a storage unit protective cover, could have resulted when the valve was opened and pad contents were discharged.

Recommendations: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

References: 1, 9, 13

Comments: See Table 3, Suggested Sampling Strategy in Section 5.0. Inconsistent

SWMU Number: 7 **Photo Number:** 21

Name: Drum Washing Pad

Type of Unit: Concrete Pad

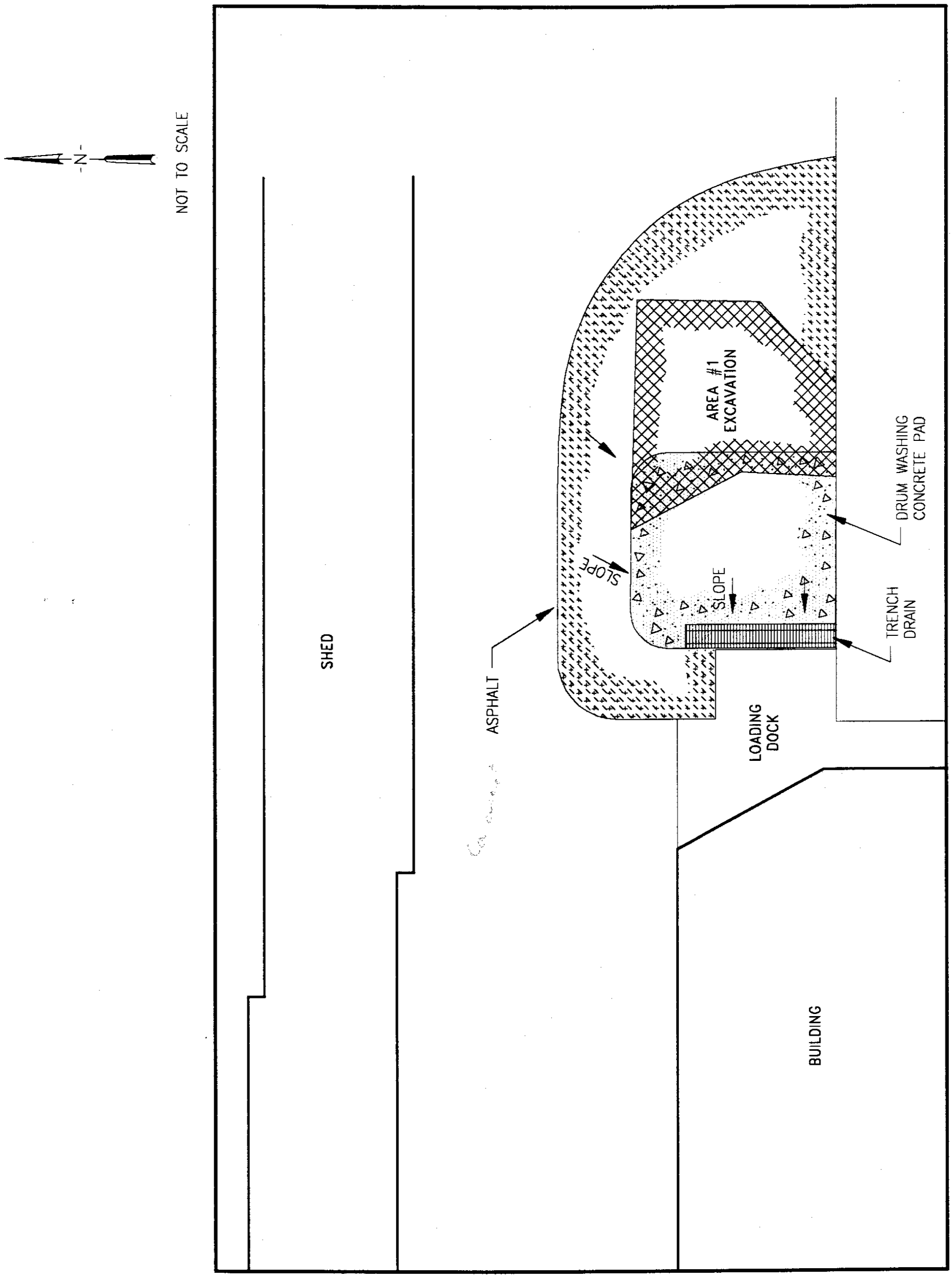
Period of Operations: 1980 - 1990

Physical Description and Condition: The drum washing pad (Figure 7), adjacent to the northern central wall of the main facility along the facility's alleyway, was a western sloping trapezoidal-shaped concrete pad used for rinsing drums prior to disposal. The concrete pad, which measured 22 feet by 17 feet, was used to rinse empty drums that once contained pure products such as caustics, acids, copper, and tin and lead anodes used in electric circuit board production. All drums contained less than an inch of liquid and were triple rinsed and the rinsewaters were directed to a trench drain (AOC No. 1) next to the pad. Rinsewaters were then diverted to a terra cotta pipe connected to the drain and were gravity fed to the WWTP (SWMU No. 2).

When Alcatel began closure of its circuit board manufacturing processes in 1989, the company removed the alleyway's asphalt and the drum washing pad to construct a storm water collection system. During the removal, an area of soil discoloration was found next to and partially underneath the pad. Sampling confirmed the presence of copper and lead, and the excavation of contaminated soil occurred in February 1990. A hairline fracture in the drum washing pad may have been the possible source for contaminanation.

During the VSI, personnel observed that the area was newly paved with concrete for the stormwater collection system.

Wastes and/or Hazardous Constituents Managed: The drum washing pad was a concrete pad used to rinse "legally" empty drums that once contained pure product used in circuit board production. Hazardous constituents included caustics, acids, copper, and tin and lead anodes. The number of drums washed per week is unknown; however, personnel from Alcatel stated that many drums were washed on the pad. The sloped



CDM FEDERAL PROGRAMS CORPORATION

DRUM WASHING PAD

ALCATEL NETWORK SYSTEMS

RALEIGH, NORTH CAROLINA

FIGURE N

7

pad directed all rinsewaters to a trench drain (AOC No. 1) which also was a waste drainage exit from the main facility. From the drain, waters were gravity-fed along a terra cotta pipe to the WWTP (SWMU No. 2). After drums were tripled-rinsed, they were crushed and sent offsite for disposal.

Release Pathways: Air ( ), Surface Water ( ), Soil (X)
Groundwater ( ), Subsurface Gas ( )

History and/or Evidence of Releases: In October 1989, Alcatel began construction of a storm water collection system in the alleyway in conjunction with closing the company's circuit board production lines. The concrete and asphalt covering were removed which uncovered an area of discoloration (Area No. 1, Figure 8) next to and partially underneath the drum washing pad. Initial sampling of Area 1 confirmed the presence of lead and copper, but did not reveal any quantitative measure of the contaminants. The suspected sources for the contamination were a leaking joint in a 2-inch PVC spent copper etchant line running underground through the area and a hairline crack in the drum washing pad. Excavation of the area began and was completed before February 9, 1990. Approximately 20 tons of soil were removed and transported offsite by Williams Trucking Company, Inc. to GSX landfill in Pinewood, South Carolina. The finished excavated area was approximately 185 square feet and dug to a depth of 4 to 5 feet bls. The boundaries of the area were determined by field analysis where once soils approached background levels, the excavation activities ceased.

Recommendations: No Further Action (X)
RFA Phase II Sampling ( )
RFI Necessary ( )

References: 1, 25

Comments: No further action is recommended for this unit. Removal of the contaminated soils and concrete wash pad was initiated by Alcatel to facilitate the construction of a storm water collection system. Soil(s) were excavated and sampled to clean (background) levels.

AOC Number: 1

Photo Numbers: 17,18,19,20, 21,22,23,24,25,26

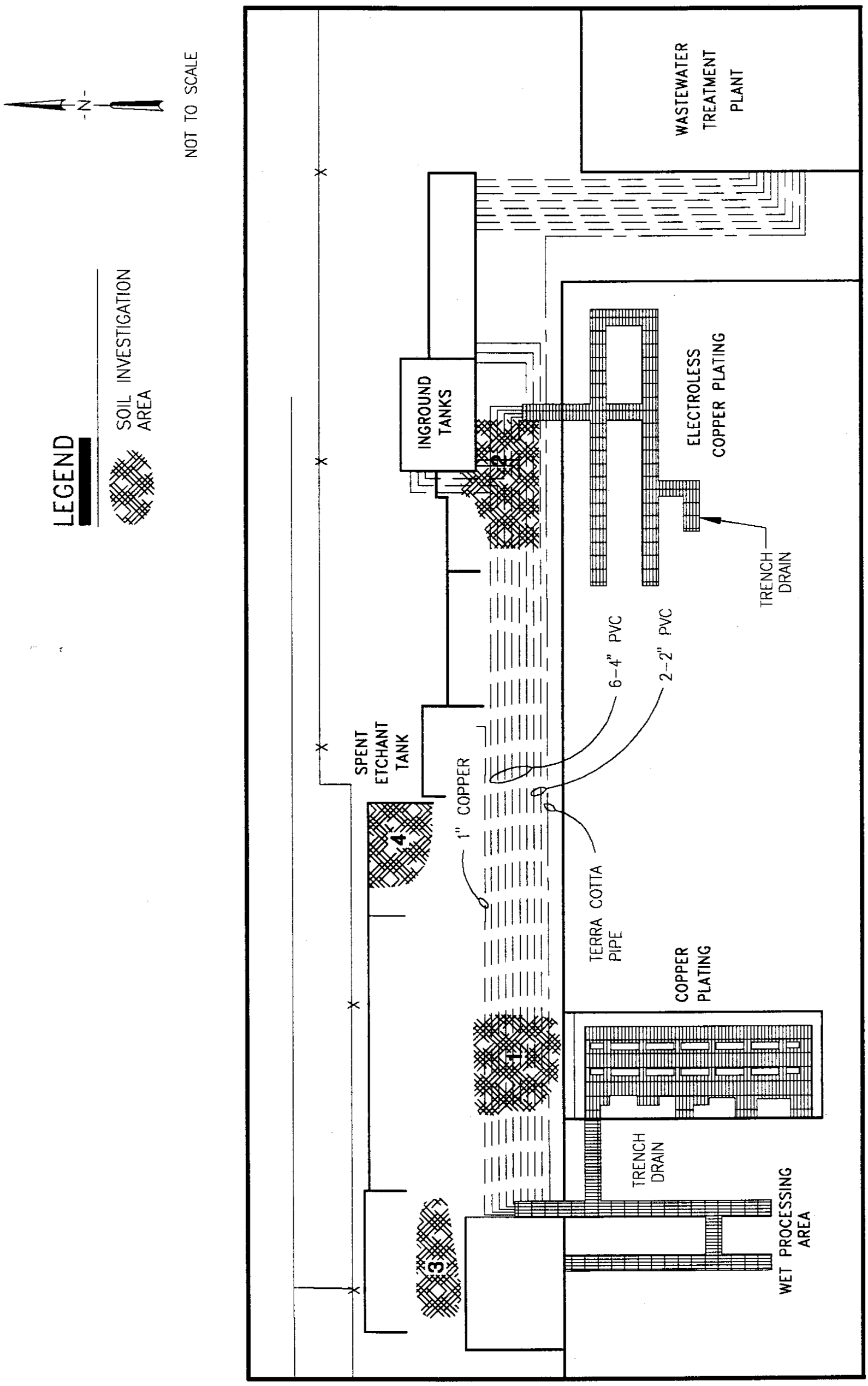
NAME: Process Effluent Drainage System/Alleyway

TYPE OF UNIT: Concrete Trenches/PVC, Terra-Cotta Piping System

PERIOD OF OPERATIONS: 1978 - 1990

Physical Description and Condition: Alcatel operated an extensive waste drainage system transporting aqueous wastes from the main facility's assembly lines to the onsite holding tanks (SWMU No. 2) or the wastewater treatment plant (Figure 8). The system consisted of floor trenches encompassing the wet processing area, the copper plating line, and the electroless copper plating line that captured all releases and spills underneath the conveyer belts. The concrete trenches, approximately four feet wide and 10 - 14 inches deep, were set in the concrete foundation during construction of the main building. One trench system in the copper plating room was documented to be five feet deep. The spills and releases (drips) would follow the drainage system towards two exit areas located along the main facility's northern wall. There, the wastes would either flow into a terra-cotta pipe which directed the fluids toward the WWTP or six 4-inch PVC pipes which directed the wastes toward the on-site holding tanks. A transfer line for spent copper etchant also discharged from the farthest exit from the WWTP and ran underneath the drum washing pad (SWMU No. 7). Related wastes were pumped through two 2-inch PVC pipes to the lime mixing shed. The outdoor section of the drainage system was an underground gravity flow piping system, which extended from the farthest exit from the main building to the WWTP. The outdoor section of the drainage system covered approximately 125 feet in length and was 4 feet wide.

Several modifications of the drainage system occurred in 1988 in conjunction with the modifications to the holding tanks. The six 4-inch and two 2-inch PVC pipes in the outdoor system were abandoned and four new double contained PVDF pipes were installed for overhead pumping of aqueous wastes to the holding tanks and lime mixing shed.



CDM FEDERAL PROGRAMS CORPORATION

PROCESS EFFLUENT DRAINAGE SYSTEM/ALLEYWAY LAYOUT

ALCATEL NETWORK SYSTEMS

RALEIGH, NORTH CAROLINA

FIGURE I

8

When Alcatel began preparations for the closure of the assembly lines and waste operations in 1989, the company was constructing a storm water collection system designed to treat the first several thousand gallons of water captured through the on-site WWTP. Contractors began construction on October 23, 1989, but after the existing asphalt, concrete paving, and underlying soils were removed, two areas of soil discoloration were noted. The areas contaminated with inorganics and acidic wastes, were labeled areas 1 and 2. After approximately 65 cubic yards were excavated from these areas before February 9, 1990, Alcatel discovered another area of contamination, area 3, tainted by a solvent spill near the maintenance shop. A fourth area was investigated which was the site of a corrosive chemical tank spill.

Presently, the alleyway is paved with fresh asphalt with no signs of the previous soil investigations except for borehole patching in area 4. Concrete plugs the exits of the drainage pipes from the main building and no piping remains on site. No leaks, stains or spills were noted in the alleyway. Inside the main facility, Alcatel converted the copper plating lines and the wet processing area into office space. Trenches and concrete floors were sandblasted, high-pressured washed, sampled for possible contamination, filled in with concrete and building materials, paved over, and carpeted for the office area. The electroless copper plating line was closed, cleaned and filled, and has been converted into a cafeteria/kitchen area. No signs of stains or spills were observed inside the main facility, and no evidence of trenches, drain systems, etc., were present.

Wastes and/or Hazardous Constituents Managed: The effluent drainage system captured and transported the following wastes generated at the wet processing area, electroless copper plating room and the copper plating from: tin, lead, copper, chromium, nickel, mineral acids and caustics, and ammonium bifluoride.

Release Pathways: Air (U), Surface Water (M), Soil (M) Groundwater (M), Subsurface Gas (M).

History and/or Evidence of Releases: In October 1989, Alcatel began construction of a storm water collection system in the alleyway north of the main facility. After the asphalt and concrete covering were removed, workers discovered two areas of soil discoloration. Immediate field testing revealed that both areas had low pH waste. The locations of the discolored soil were named Area 1 and Area 2.

Area 1 located at the waste drainage exit from the WWTP along the main facility's northern wall was contaminated with copper and lead. Initial sampling of Area 1 only confirmed the presence of the constituents and not the quantitative amounts. The suspected sources for Area 1 were a leaking joint in a 2-inch PVC spent copper etchant transfer line running underground through the area and a hairline crack in a concrete pad. The concrete pad laid underneath a drum-washing pad immediately west of Area 1. Excavation of Area 1 began and was completed before February 9, 1990. Approximately 20 tons of soil were removed and transported off site by Williams Trucking Company, Inc. to GSX landfill in Pinewood, South Carolina. The finished excavated area was approximately 185 square feet and dug to a depth of 4 to 5 feet bls. The boundaries of the area were determined by field analyses of soils. Once soils approached background levels, the excavation activities ceased.

Area 2, adjacent to the in-ground holding tanks (SWMU No. 1) and a storage shed, was an area contaminated with lead and copper. Initial sampling of Area 2 only confirmed the presence of the constituents and not the quantitative amounts. The suspected source for the contamination were leaks from the six underground PVC pipes. The in-ground holding tanks were eliminated as a source since no reports of leaks or cracks in the concrete sumps existed or were observed. Excavation of the area began in February 1990 and was completed in late March 1990. Approximately 104 tons of soil were removed. During the excavation, groundwater was reached at six feet bls and bedrock was encountered at nine feet bls; excavation was completed at this depth. The areal extent of the finished excavated area was 800 square feet. Several contaminated locations, however, remained untouched due to the locations being currently inaccessible by conventional removal techniques. These locations were under the terra-cotta pipe,

the north alcove of Area 2 between the holding tanks and chemical storage sheds, and the east and west ends of the excavation.

A second excavation began on Area 2 in November of 1990. Prior to excavation, utility lines and a portion of the storage shed were removed for access into contaminated soils. Approximately 145 additional tons of soil were removed and transported to GSX. Field testing and confirmatory analysis of soils were used to determine the extent of excavation.

During the excavations of areas 1 and 2, a third area of contamination was discovered 40 feet northwest of area 1. The area was a site of three small solvent spills occurring in the early to mid-1980's where approximately less than 5 gallons of 1,1,1 trichloroethane were spilled over the period of time. The spills occurred from the transfer via pipeline (gravity-fed) of 1,1,1-trichloroethane from storage tanks to a still inside the main building, just south of Area 3. The still, used for distilling trichloroethane in the electric board cleaning process, was supervised by workers during trichloroethane transfer. Workers' inattention lead to a few of the minor overlow releases. An electrical cut-off switch was installed in the system to prevent spills and warn of possible overflow after the first release. The still generated a trichloroethane sludge waste which was collected and stored in 55-gallon drums on RCRA storage Pad No. 2. Spill response activities consisted of using absorbent clay to clean up the spill or simply letting the product absorb into the asphalt. Sampling prior to excavation revealed waste concentration in the soils: 1,1,1-trichloroethane (2-2200 ug/kg); 1,1,2 trichloro-ethane (3 ug/kg); 1,1-dichloroethane (5-100 ug/kg); 1,2 dichloro-ethane (11 ug/kg): 1,1-dichloroethylene (500 ug/kg); and tetra-chloroethene (110-250 ug/kg). Excavation activities removed a total of 92 tons of soil. Eight subsurface samples collected after the excavation of area 3 revealed that low concentrations of VOCs remained present near the area. Soils under the building foundation may have been impacted.

Simultaneous with the area 2 excavation, Alcatel initiated a groundwater investigation to monitor the surficial aquifer for contamination. Five permanent monitoring wells (MW-1 through MW-5), were installed on August 10, 1990 encircling the entire main facility. Each well was constructed with 2-inch schedule 40 PVC screens and casings. The wells were sealed with one to two feet of bentonite just above the screens, and a bentonite cement mixture was used from the top of the bentonite seal to the surface. The depths of the wells varied from 15 to 20.5 feet bls. Sampling of the wells, the analysis consisting only of metals and VOCs, revealed several waste constituents (highest readings given): copper (1200 ug/L); 1,1,1-trichloroethane (140 ug/L); PCE (210 ug/L); and 1,1-dichloroethane (23 ug/L). The readings from groundwater samples collected at MW-4 and MW-5, located south and southeast respectively from the main building, may have indicated the presence of another groundwater impact source besides the areas north of the facility, specifically MW-4 with detection of PCE.

On April 8, 1991, Alcatel initiated a soil sampling investigation of a fourth area (area 4) located along the facility's alleyway. Area #4 was the location of a corrosive chemical shed west of the spent etchant tank (SWMU No. 3). In the early to mid-1980's, fluoroboric acid was spilled. Presumably, this was a small amount since facility personnel never detected a spill. The spill may have occurred when a carbon treatment tank was used to clean the contents (fluoroboric) of the tin/lead bath tank of spent organics. The spill probably occurred when fluoroboric was transferred from the tank to the carbon treatment tank, but no spills were observed by facility personnel. Prior to the sampling on April 8, 1991, the asphalt/concrete was removed to allow access to the soil. Twelve samples were collected at depths of 0-6 inches and at 18 and 24 inches. One sample location had soil samples collected at 2, 4, and 6 foot intervals. Three asphalt cores were also analyzed. All samples were analyzed for total lead only. Results showed lead contamination (highest reading 21,700 mg/kg) in an asphalt sample (TCLP lead extractable), at a depth of 1 foot bls. Area 4 encompassed approximately 700 square feet.

During the investigations of the alleyway, an investigation of the indoor effluent drainage system commenced in August, 1990. Alcatel began closure of the assembly lines and waste operations in early July of 1990. For the closure activities, Alcatel jackhammered all corroded floor areas to solid concrete, sampled floor and trenches for possible contamination, filled trenches and corroded areas with concrete, and converted the areas into office space/cafeteria facilities. Wipe samples of the floors and trenches were conducted in the electroless copper plating area and the etcher, gold and reflow room. The analyses, testing only for copper and lead, did not detect any contamination in the areas.

Recommendations: No Further Action ( )
RFA Phase II Sampling (X)
RFI Necessary ( )

References: 1, 4, 5, 20, 22, 25

Comments: The drainage system and alleyway have been classified as an Area of Concern due to geographical location at the north side of the facility and common flow areas. Alcatel has installed a network of groundwater monitoring wells as a part of the groundwater quality assessment. Additional sampling is recommended and discussed in Section 5.0, Table 3, Suggested Sampling Strategy.

5.0 SUMMARY AND SUGGESTED SAMPLING STRATEGY

This section consists of Table 2, which lists the SWMUs and AOC identified during the VSI conducted on November 7, 1991, and Table 3, the suggested sampling and recommendations for those applicable SWMUs and AOC requiring further action. The photodocumentation pages follow.

TABLE 2

SOLID WASTE MANAGEMENT UNITS (SWMUs)
AND AREA OF CONCERN (AOC)
ALCATEL NETWORK SYSTEMS

SWMU NO.	SWMU NAME
1	In-ground Holding Tank
2	Wastewater Treatment Plant
3	Spent Etchant Tank
4	RCRA Drum Storage Pad No. 1
5	Sludge Containment Pad
6	RCRA Drum Storage Pad No. 2
7	Drum Washing Pad

AOC NO.	AOC NAME
1	Process Effluent Drainage System/Alleyway

TABLE 3

SUGGESTED SAMPLING STRATEGY AND RECOMMENDATIONS
ALCATEL NETWORK SYSTEMS

Unit No.	Unit Name	Operational Dates	Suggested Sampling and/or Recommendations	Evidence of Releases
4	RCRA Storage Pad No. 1	1981-1990	The spill of 2-3 gallons of tin/lead stripper in 1983 was captured and treated. Closure certification and inspection have already been received. Closure of the RCRA Storage Pad was approved on June 12, 1992. No further action is required for this unit.	Unknown
6	RCRA Storage Pad No. 2	1982-Present	Closure certification and inspection have already been received for RCRA Storage Pad Number 2. No further action is planned.	Unknown
AOC	Process Effluent Drainage System Alleyway	1978-1990	Soil and groundwater contamination were discovered in the alleyway during the construction of a storm water collection system. Sources for the contamination are leaky PVC pipes and joints in the drainage system (areas 1 and 2), and possibly several spills occurring in the early to mid-1980's (areas 3 and 4). In areas 1 and 2, extensive soil removal and confirmatory sampling has established the areas clean of contaminants. Confirmatory sampling in area 3, however, detected low levels of volatile organics remaining in the excavation walls. Potentially, the soils under the building floor slab may be impacted.	Yes

TABLE 3

SUGGESTED SAMPLING STRATEGY AND RECOMMENDATIONS
ALCATEL NETWORK SYSTEMS

Unit No.	Unit Name	Operational Dates	Suggested Sampling and/or Recommendations	Evidence of Releases
AOC (continued)	Process Effluent Drainage System Alleyway	1978-1990	In order to better identify and characterize the impact on this area, further soil sampling in the areas around MW-4 and MW-5 are recommended due to the presence of organic contamination. The installation of additional groundwater wells to assess the vertical and horizontal extent of groundwater impact is recommended with wells placed up and downgradient of MW-4. These wells will help to determine the migration and extent of organic contamination to include PCE. A fracture trace analysis should be conducted from aerial photographs to delineate the geometric configuration of the fracture network. A few monitoring wells would then be installed along the predominant fracture traces to better define contaminant migration characteristics. Additional wells could then be installed in "capture zones" for a pump and treat recovery system. Additionally, coring of the foundation in portions of the facility where drainage ways were constructed should be considered to collect underlying soils for VOC and metals analyses.	

REFERENCES

1) CDM Federal Programs Corporation Field Notebook No. 350, November 19, 1991 for RCRA Facility Assessment/Visual Investigation, Alcatel Network Systems Corporation, Raleigh, N.C., Robert Rose, Author.

2) Beckett, Arnie, ITT Telecommunication Corp., letter to Ray Cozart, EPA Region IV, November 4, 1980. Subject: Clarifications of Hazardous Waste Activity Notification.

3) Bius, Daniel L., NCDEHNR, letter to Dikran Kabbendjian, Alcatel Network Systems, May 29, 1990. Subject: Approval of RCRA Permit Modification and name change.

4) National Environmental Technologies, Inc. Phase I Soil & Groundwater Impact Assessment, Alcatel Network Systems, 2912 Wake Forest Road, Raleigh, N.C., February 1991.

5) National Environmental Technologies, Inc. Equalization Basin Groundwater Impact Investigation, Supplemental Groundwater Sampling Information, February 12, 1991, with cover letter to Dikran Kabbendjian, Alcatel Network Systems, with attached data summary.

6) Aqua Tech, Environmental Consultants, Laboratory data sheets and sampling location map, February 25, 27, 1991, RCRA asphalt drum storage pad, Alcatel Network Systems.

7) Beckett, A., ITT Telecommunications Corp., letter to O. W. Strickland, North Carolina Solid & Hazardous Waste Management Branch, February 4, 1981. Subject: Amendment of Item IV of Form 3 Permit Application.

8) Strickland, O.W., North Carolina Department of Human Resources, letter to Annie Beckett, ITT Telecommunications, June 12, 1981. Subject: RCRA interim status inspection.

9) Strickland, O.W., NCDHR, letter to Dikran Kabbendjian, ITT Telecommunications Corp., August 5, 1983. Subject: Hazardous Waste Storage Permit.

REFERENCES (Continued)

10) Meyer, William L. NCDHR, letter to Bobby D. Rasnick, ITT Telecom Products Corp., July 13, 1987. Subject: Compliance Order with Administrative Penalty, Docket No. 87-499.

11) Hamner, William F., NCDHR, letter to Frederick A. Burke, Alcatel Network Systems Corp., August 6, 1987. Subject: Name Change.

12) Burke, Frederick A., Alcatel Network Systems Corp., letter to William F. Hamner, NCDHR, August 20, 1987. Subject: Revised EPA Form 1 to reflect name change.

13) Meyer, William L., NCDHR, letter to Dikran Kabbendjian, Alcatel Network Systems Corp., November 6, 1987. Subject: Draft modified hazardous waste storage permit.

14) USGS Topographic Maps, Raleigh East, N.C. 1968 (photorevised 1987), Raleigh West, N.C., 1968 (photorevised 1987), 7.5 minute, 1:24000 scale.

15) Kabbendjian, Dikran V., Alcatel Network Systems Corp., letter to P. Diane Newton, NCDHR, April 6, 1988. Subject: Form 3, Part A Amendment.

16) Hamner, William F. NCDHR, letter to Dikran Kabbendjian, Alcatel Network Systems Corp., April 14, 1988. Subject: Final RCRA Permit.

17) Rhodes, Jerome H. NCDHR, letter to Dikran Kabbendjian, Alcatel Network Systems Corp., July 26, 1988. Subject: Compliance Order with Administrative Penalty, Docket No. 88-255.

18) Rhodes, Jerome H., NCDHR, letter to J. Kevin Milliken, Moore & Van Allen, September 7, 1988. Subject: Mitigation of Civil Penalty assessed under Compliance Order with Administrative Penalty, Docket No. 88-255.

19) Kabbendjian, Dikran, Alcatel Network Systems, letter to Kathleen Z. Lawson, NCDEHNR, March 2, 1990. Subject: Workplan to define extent of solvent contamination.

REFERENCES (Continued)

20) Westinghouse Environmental & Geotechnical Services, Inc. Environmental Cleanup - Area 2 Addendum, March 1991.

21) U.S. Dept. of Commerce, Climatic Atlas of the United States (Washington, D.C. GPO, June 1968) Reprint: 1983, National Oceanic and Atmospheric Administration.

22) Cusp, Dale, Raleigh Public Utilities Department, Raleigh, North Carolina, Telecon, January 23, 1992 with D. Trimpe, CDM/FPC. Subject: Surface Water Supply Sources, Alcatel Network System.

23) Olive, Frank, Wake County Health Department, Raleigh, North Carolina, telecon, January 24, 1992 with D. Trimpe, CDM/FPC. Subject: Private Well use in Raleigh area.

24) Kabbendjian, D., Alcatel Network Systems, Letter to Jerome H. Rhodes of the NCDEHNR, November 3, 1989. Subject: Discovery of copper and lead at elevated levels in soil.

25) Westinghouse Environmental & Geotechnical Services, Inc. Site Specific Work Plan for Alcatel Network Systems, February 1990. Project No. 4115-90-502.

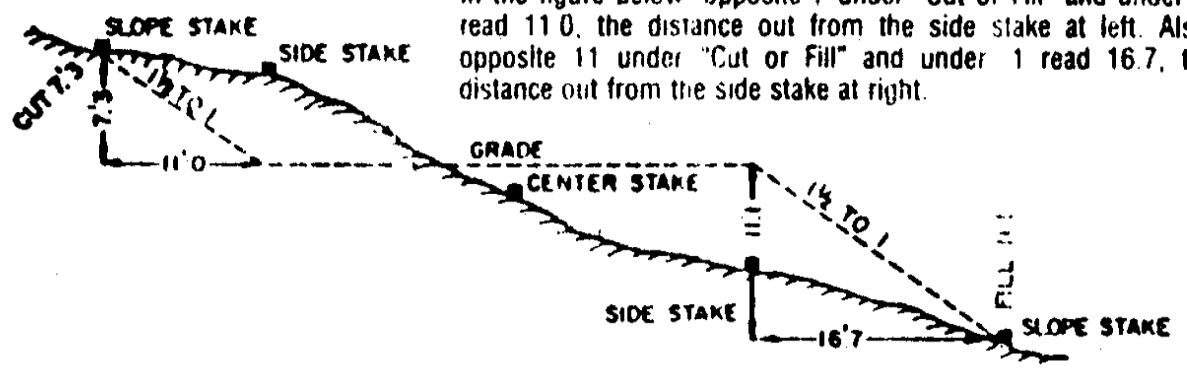
26) National Environmental Technologies, Inc., Equalization Basin Groundwater Impact Investigation, cover letter to Dikran Kabbendjian, January 4, 1991, with analytical results and data summary, Alcatel Network Systems.

APPENDIX A

VSI LOGBOOK/PHOTODOCUMENTATION LOG

Roadway of any Width. Side Slopes 1½ to 1.

In the figure below opposite 7 under "Cut or Fill" and under 3 read 11.0, the distance out from the side stake at left. Also, opposite 11 under "Cut or Fill" and under 1 read 16.7, the distance out from the side stake at right.



Cut or Fill	0	1	.2	.3	.4	.5	.6	.7	.8	.9	Cut or Fill
	Distance out from Side or Shoulder Stake										
0	0.0	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	0
1	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	1
2	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	2
3	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.6	5.7	5.9	3
4	6.0	6.2	6.3	6.5	6.6	6.8	6.9	7.1	7.2	7.4	4
5	7.5	7.7	7.8	8.0	8.1	8.3	8.4	8.6	8.7	8.9	5
6	9.0	9.2	9.3	9.5	9.6	9.8	9.9	10.1	10.2	10.4	6
7	10.5	10.7	10.8	11.0	11.1	11.3	11.4	11.6	11.7	11.9	7
8	12.0	12.2	12.3	12.5	12.6	12.8	12.9	13.1	13.2	13.4	8
9	13.5	13.7	13.8	14.0	14.1	14.3	14.4	14.6	14.7	14.9	9
10	15.0	15.2	15.3	15.5	15.6	15.8	15.9	16.1	16.2	16.4	10
11	16.5	16.7	16.8	17.0	17.1	17.3	17.4	17.6	17.7	17.9	11
12	18.0	18.2	18.3	18.5	18.6	18.8	18.9	19.1	19.2	19.4	12
13	19.5	19.7	19.8	20.0	20.1	20.3	20.4	20.6	20.7	20.9	13
14	21.0	21.2	21.3	21.5	21.6	21.8	21.9	22.1	22.2	22.4	14
15	22.5	22.7	22.8	23.0	23.1	23.3	23.4	23.6	23.7	23.9	15
16	24.0	24.2	24.3	24.5	24.6	24.8	24.9	25.1	25.2	25.4	16
17	25.5	25.7	25.8	26.0	26.1	26.3	26.4	26.6	26.7	26.9	17
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19	28.5	28.7	28.8	29.0	29.1	29.3	29.4	29.6	29.7	29.9	19
20	30.0	30.2	30.3	30.5	30.6	30.8	30.9	31.1	31.2	31.4	20
21	31.5	31.7	31.8	32.0	32.1	32.3	32.4	32.6	32.7	32.9	21
22	33.0	33.2	33.3	33.5	33.6	33.8	33.9	34.1	34.2	34.4	22
23	34.5	34.7	34.8	35.0	35.1	35.3	35.4	35.6	35.7	35.9	23
24	36.0	36.2	36.3	36.5	36.6	36.8	36.9	37.1	37.2	37.4	24
25	37.5	37.7	37.8	38.0	38.1	38.3	38.4	38.6	38.7	38.9	25
26	39.0	39.2	39.3	39.5	39.6	39.8	39.9	40.1	40.2	40.4	26
27	40.5	40.7	40.8	41.0	41.1	41.3	41.4	41.6	41.7	41.9	27
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29	43.5	43.7	43.8	44.0	44.1	44.3	44.4	44.6	44.7	44.9	29
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31	46.5	46.7	46.8	47.0	47.1	47.3	47.4	47.6	47.7	47.9	31
32	48.0	48.2	48.3	48.5	48.6	48.8	48.9	49.1	49.2	49.4	32
33	49.5	49.7	49.8	50.0	50.1	50.3	50.4	50.6	50.7	50.9	33
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35	52.5	52.7	52.8	53.0	53.1	53.3	53.4	53.6	53.7	53.9	35
36	54.0	54.2	54.3	54.5	54.6	54.8	54.9	55.1	55.2	55.4	36
37	55.5	55.7	55.8	56.0	56.1	56.3	56.4	56.6	56.7	56.9	37
38	57.0	57.2	57.3	57.5	57.6	57.8	57.9	58.1	58.2	58.4	38

Name Robert Rose + Dale Trimpe

Address CDM / FPC

Phone

Project Alcatel
2912 Wake Forest Road
Raleigh, North Carolina
R04031

CONTENTS

PAGE NO	REFERENCE	DATE

Thursday 11/7/91

9:00 FRC arrived onsite

Those present:

Kathleen Lawson
Environmental Engineer
Hazardous Waste Permitting
Solid Waste Management Div.
NCDEHNR

Robert McDaniel, P.G.
Hydrogeologist
Solid Waste Management Division
NCDEHNR

Dikran Kabbendjian
Supervisor
Human Resources Service
Alcatel

Bob Rose and Dale Trippe
Work Assignment Manager / VSI inspector
CNM FR[illegible]

Thursday 11/7/91

I. Waste Processing
- will receive property layout map
1. manufacturing took place on NE side of main bldg until 1990
a. area near the manufacturing was resurfaced w/ concrete + resloped
b. underground tank installed to store rainwater
c. 1990 - circuit board production closed
1. offices occupy this area now
e. underground tank is not used now
f. found contamination in area of resloping
2. Water table is about 10' bls, no karst terrain
3. Alcatel is French-owned

II. Company History
A. Kellogg Switching in 1958 began work on the property.
1. produced electric apparatus
C ITT in the 60's bought property from Kellogg

Thursday

in 1987.
1 CGE is now Alcatel Alstom
2. Alcatel's full company name is Alcatel Network Systems
a. Was changed from Alcatel NA Corp
E. band was virgin land before Kellogg bought the property.
1. Keebler, past Gordon Potatoe Chips is now S of Alcatel
2. a dump existed 0.25 mile S of facility on Pepsi property.
a. no SW or GW influence from dump
3 a ditch exists along N end of property, runs into Cracker Creek
4. Keebler has tank (fuel) near Alcatel property
a. no leaks from it
5 Holly Park Shopping Center lies NW of site
a. residential area also NW of site
6. Fe readings are somewhat high along property creek
a. runoff from properties lying N of facility
7. Rural Plumbing lies S of facility, upgrad

Thursday 11/7/91

8 Automotive service S of facility, does engine work

F. Alcatel does not manufacture circuit boards, stopped 7/90

1 continued assembling boards until 9/91

2 no soldering, stopped 9/91

3 Alcatel now specializes in research and development, sales, marketing, & small research laboratories

4. Alcatel removed equipment and waste treatment plant

a. deconned WWTP equipment

1 water from decon shipped offsite to another WWTP

b some RCRA waste left from 9/91

5. Solid waste generated from cafeteria & office

a. labs generate freon, 5 gallons/6 months

6. Alcatel obtained an air permit for solder machine, production plant, & solvents but is now cancelled.

7 lease facility across the street does Alcatel's packaging

Thursday 11/7/91

9 tax exemption in '78 for waste water abatement, but paper unprocessed filed

9. in '91, fines levied but Alcatel solved problems

G. Past production

1. Kellogg used tin/lead soldering in N part of bldg.

2. main bldg was added onto several times

3 no remnants of these past operations

4. in '78 ITT specialized in sedimentary board production

a. plated Cu, Sn, Pb, Au

b. Chromate coating on aluminum w/ black dye sealing.

c. Zn-chloride on steel for paint preparation.

5. in '82 anodizing treatment was dismantled

a. floor trenches in production units

b. 2 exits from bldg, lead to WWTP

6 in '90 epoxy on floors was eaten but concrete was not disturbed

Thursday 11/7/91

1. 8" of concrete
2. stains were on concrete
3. jackhammed corroded concrete until sodbid or unstained concrete was reached.
4. fresh concrete poured over rough spots
5. no soil analyzed underneath foundation

7. In '85, epoxy was placed along conveyer belt line of chromium-plating line
   a. epoxy did not hold up from dripping of acids
   b. entire area was cleaned in '87 to restore concrete
   c. reinforced floor w/ graphite flake vinyl esther compound
   d. drips from tanks and ventilation
   e. water that rinsed the floor was directed to WWTP
   f. filled corroded areas w/ epoxy concrete
   g. area is now completely filled w/ concrete and building materials
      1. all piping deconned and removed, PVC piping

Thursday 11/7/91

      i. retention pans around belts and tanks if spills occurred were drained towards floor drains
         1. floor trenches were 4'x5', 6" concrete foundation
      j. sludges went into drain other to WWTP
   8. solder machine + freon cleansing in S part of bldg.
   9. used oil in soldering process but now the process is dry soldering
      a. drips collected in buckets to 55 gallon drums on concrete pad.
      b. 6 to 7 gallons of flux/day generated waste (alcohol based).
      c. 3 soldering machines
      d. oil + soldering waste was less than flux waste, less than 5G/day
         1. oil in contact w/ Pb, stored on same concrete pad
   C. when operations were closed, no cleansing of floors occurred
      1. no floor drains existed in production/soldering area

Thursday

10. Freon cleansing that occurred on conveyer belt line was in same part of bldg.
    a. closed drip system
    b. stilling machine separated clean + dirty freon
        1. freon waste stored in drums, 12 drums/yr
        2. freon vapors lost in cleansing operations
    c. freon/trichloroethane used for hand cleansing before/after operations
        1. these wastes stored in 55-G drums
    d. 2 vapor degreasers, separate from conveyer and stilling machine
11. solvents used in silk screening
    a. MEK + iso. alcohol for paint thinner & cleanse screens
    b. 3 drums/yr, washed screens everyday
    c. recycled rags
    d. dismantled screen unit in 7/90
    e. drainage system directed to WWTP
        1. drum placed in floor + used as a sump
        2. waste pumped to drains
        3 an outer drum encased w/ concrete + an inner drum stored wastes
    f. inks are in yellow containers
    g. all unusable/defective equipment sent as waste to landfill
        1. gold or boards sent to gold recovery
        2. oil from hydraulic system was recycled
12. Contamination of clay pipe area
    a. pipe leaked carrying pipe etchings (Cu, Pb)
    b. concrete wash area for drums had small crack in pad
    c. 6 pipes lead to underground storage tanks for waste storage; wastes were then directed to WWTP
        1. flexible liners in tanks w/a pump from WWTP to protect from overfilling
        2. ceased using tanks in 7/90
        3. cleansing of tanks occurred from 7-10/90
            a. pipes taken out + sent out as hazardous waste; tanks decontam by high temp/high press water
            b. wastes treated at WWTP or sent out
            c. no stains or sandblasting
            d. plastic lined steel tanks were sold
            e. cleaned concrete
            f. sampling occurred around underground tanks, below standards

Thursday 11/7/91

g. pipes were double contained, previous pipes were only single contained

B. WWTP

a. wastewater of small concentrations sent directly to equilization basin, not the underground tanks

1. lime contact to raise ph
2. sludge skimmed rd sent to holding tanks (concrete)
3. pumped to filter press; water back to basin
4. sludge to hopper & sent to roll off containers (40-50% solid)

350,000 gal/day

A. sent GSX
B 450,000 lb/yr, passed EP tox test

5. clean water from floaters sent to another holding tank

A. passed thru 4 sand filters; effluent sent to city
B when filters backwashed, water sent to basin; happened daily

b. sulfide treatment system never used, eventually sold

c. Batch Treatment began in '80.

1. waste come from 6 underground tanks
2. sent to chromate treatment tank, now acid/base treatment
   a. sludges sent to sludge basin
3. Cu bilated treatment tank
   a. wastes w/ Cu loosened w/ sulfuric acid, bypassed A/B treatment
   b. goes directly to effluent
4. lime mixing tank
   a. mixes lime prior to use
5. entire WWTP surrounded by trenches sent back to basin
   a. basin now is used as a chilled water tank
   b. everything mostly dismantled and shipped off
6. sampling occurred around basin, all samples were downgradient & showed no contamination

III. Visual Inspection 12:20
weather: partly sunny, mid 60's

photos:

#15 - copper electroplating line, sump location

#16 - electroless copper plating line, anodizing line (now printing room converted in 12/90).

#17 - paintroom, shelving occupies area now.

#18 - electroplating line floor, cont of #16

#19 - trenches by conveyer belts, photo same locale as #18

#20-23 - freon cleansing operation area

#24 - freon containers

A. Drum storage unit has 4" retaining wall, at one time was sheltered & fenced

#25 - temporary concrete storage pad

1. fresh freon drums, flux, & other materials (raw materials)
2. only 4 waste drums fenced in were on the pad
3. concrete pad used since '81, 10'x5'
4. transport drums of a forklift to other storage unit.

B. Asphalt Storage Pad

1. used as a storage for ~~non~~ agneous waste, non-solvents
2. also stored fresh chemicals
3. built in '82 or 83, dirt base underneath
4. retention wall 9", area sloped toward wall
5. drained rainwater, kept plastic over drums
6. paved asphalt every 3 years.

C. Concrete pad where F006 storage was kept, built in '82, 15'x20'

D. RCRA Concrete Pad #2

1. retention wall & fenced, 60'x14'
2. 12 drums present: 5 flux (D001), 3 freon, 1 paint thinner (D003), 2 trichloroethane, 1 lube oil (not RCRA waste).
3. drainage valve locked; no cracks in concrete
4. culvert underneath pad to direct SW drainage underneath pad.

Thursday 11/14/91

E. Drainpipe from plumbing crosses underneath R×R towards Alcatel property.

F. Clean-up Area, maybe AOC #1
 #36a - Area #1, 10'×10'
  1. area of 1st drainage edit from main bldg.
  2. excavation of soils, lead + Cu contamination
  3. area was asphalt with drum rinsing area W of area #1
   a. drums rinsed on sloped concrete towards trench.

G. Area #3
  1. organic contamination found
  2. process - trichloroethane was used to clean tape residue off of circuit boards.

H. Area #4 had no contamination

I. Area #2 - second edit area of trenches from main bldg.
  1. 15'×36' area, lead + copper contamination

J. Underground Compartmentalized Tank
  1. grating over tanks
  2. roofing over tanks installed in '87.

K. Lime mix room + batch treatment center
  1. trench (filled in now) went to WWTP

Thursday 11/21/91

L. WWTP
  1. equilization basin, sludge basin, + clarified water basin are used for chilled water storage.

M. Silk Screening Room is now Alcatel's kitchen facilities

III Post Investigation 14:45

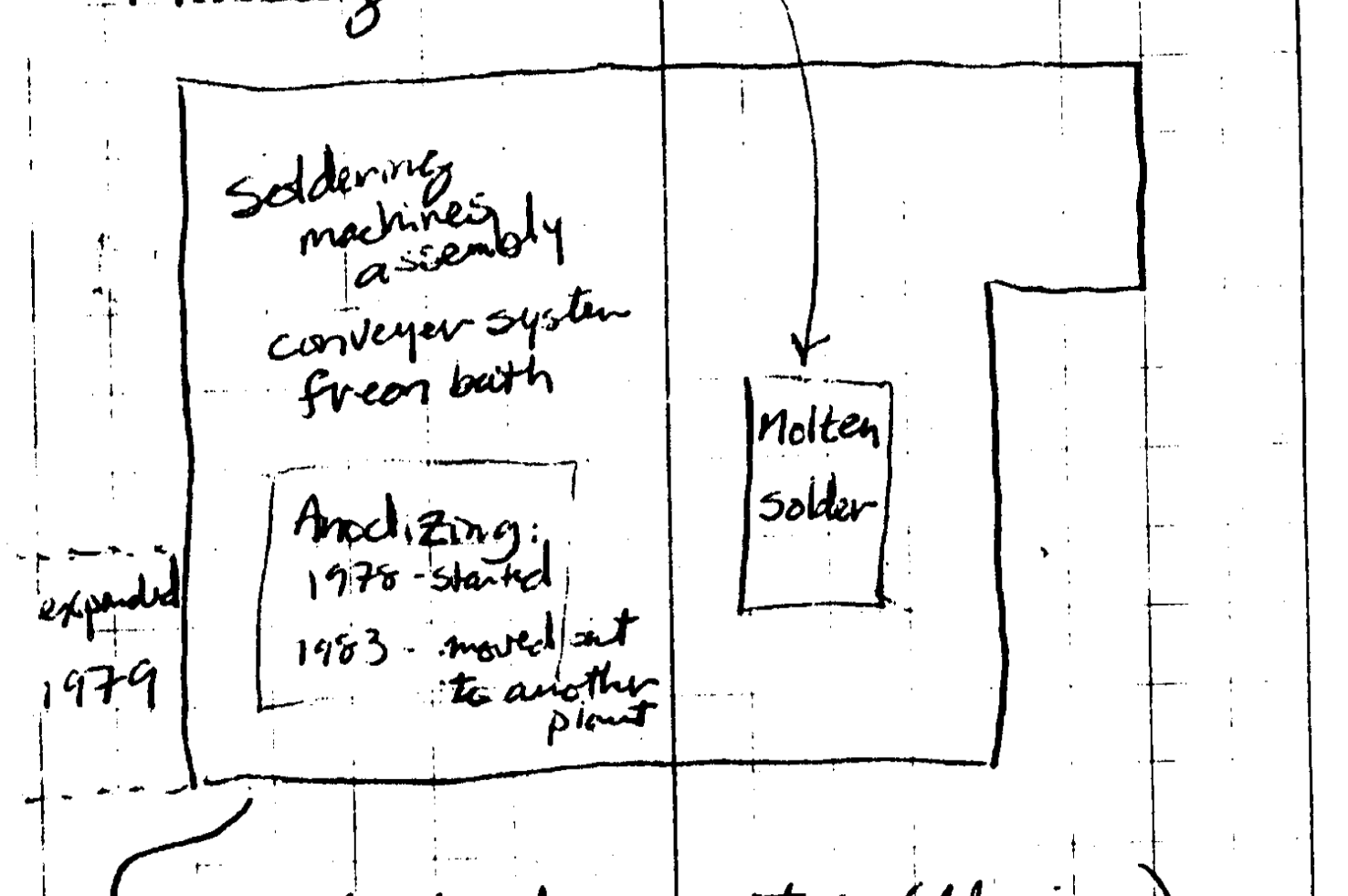
A asphalt pad had a leak from a drum in '83, 2-3 gallons of tin/lead solder stripper ammonia bifluoride
  1. neutralized by Na bicarbonate, pumped to WWTP

B Solid storage pad (next to asphalt pad)
  1. stores F006
  2. roll-off containers (20'×7'×4'), 20 yd^3, owned by Alcatel
   a. gasketed + leak-proof, plastic liner inside
   b. transported to + by GSX
   c. containers stored green bricks from filter press
    1. 100,000 - 500,000 lbs/yr
    2. '89-'91: ~~from~~ transported

3. solar evaporation was used to dry docks
4. dumpsters appear in very good shape, no evidence of leaks

C. Processing

1. Anodizing line - waste treated then to WTP
   a. dismantled & taken to Clinton in '82
   b. floor trenches uses: concrete 4-8" deep, based on facility evaluation no cracks were identified
   c. jack hammered all corroded areas to solid concrete (Aug - Sept 1982).
   d. trenches filled in w/ concrete
   e. no soils under foundation were analyzed / no contamination suspected.
2. Plating Line
   a. epoxy degraded by chips from ventilation and overhead racks
   b. clean up - washed away epoxy, sand blasted corroded concrete, filled in areas w/ concrete + epoxy, graphite flake vinyl ester covering over concrete, removed pipes w/ Hi-Press wash, the PVC pipes sent to Pinewood, SC early 1991



Thursday 11/17/94

3. original foundation 4-6"
4. Solder machines
   a. circuits mechanically laced on boards.
   b. boards sent thru wave flux line and solder line
   c. oil wave - generated flux and oil
      1. bucket used to collect spent oil & solder
      2. emptied into 55 gallon drums at pad outside door
      3. oil used for bathing is considered Toxic b/c of lead from solder
      4. 6-7 gallons/day
   d. machines moved to Building C in Sept '91
5. Silk screening of packaging (inks)
   a. cleaner MEK (65%), Isop. Alcohol (30%), Zylene (5%)
   b. washed screens daily - max of 150 gal of spent solvents/yr
      1 sent to WWTP
   c. dismantled June 1990 - drain system removed
   d. drum inside drum set into concrete on floor.
   e. inks come in small containers, no recycling of inks
   f. no boneyard
6. Underground Storage Tanks - one area compartmentalized, 6 tanks
   a. tanks area presently empty, 1990 ceased using tanks
   b. tanks purged out & sent for disposal
   c. decon - Hi press/Hi temp water to WWTP or shipped offsite
   d. no sand blasting - polypropylene
   e. plastic tanks 1/4" thick; 1,500 & 2,500 gal
   f. cleaned stainless steel cages, no degradation
   g. pipes (PVC) chopped up & sent to Penrod
7. RCRA waste at present
   a. all paper, cardboard & cans recycled
   b. air permit for blue print machines
   c. Research & Development: generates a few solvents & soldering waste, minimal amounts
8. Above ground tank housed/stored spent copper etchant from manufacturing.

Thursday 11/9/61

a. wastes transferred through pipe from acid processing area
b. located west of inground holding tanks.

10:30 Left site

Photos

Photo 21 1405	concrete walls of underground storage tanks
Photo 22 1420	view of northern end of WWTP, inside
Photo 23 1420	view of SW corner of WWTP
Photo 24 1420	view of SE corner of WWTP, office storage
Photo 25 1430	view of equilization basin, now chilled water basin
Photo 26 1440	silk screening room, now occupied by kitchen
Photo 27	cafeteria, once occupied by electroless copper plating line

Photo 14 — Borehole sampling of area #4
1335

Photo 15 — View of area #1 located NW of
1337 and east of waste spot

Photo 16 — View of 1st drainage spot, area #2
1340

Photo 17 — View of alleyway looking NE,
1340 location of area #2

Photo 18 — location of spent etchant
1350 tank

Photo 19 — underground storage tanks
1400

Photo 20 — View of inside of one of compart-
1400 mentalized tank sumps

Photo 7 — view of concrete pad looking
1305 NW

Photo 8 — RCRA pad #2 w/ drums, looking N
1310

Photo 9 — RCRA pad #2 looking E, drums
on pallets

Photo 10 — culvert underneath RCRA pad #2
1315 to divert surface water

Photo 11 — photo of locked drainage valve
1317 on the pad

Photo 12 — View of alleyway north of main
1330 facility, approximate area of area #3

Photo 13 — View of chemical storage shed,
1335 area #1

Photology 11/7/91

Photo 1
1230 — office space once occupied by wet processing area and copper plating line

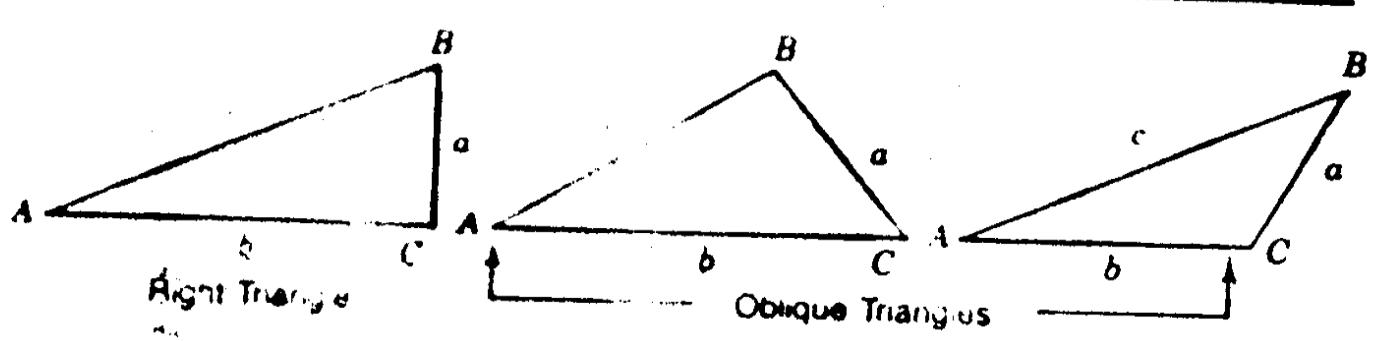
Photo 2
1230 — printing room once occupied by electroless copper plating line

Photo 3
1235 — continuation of printing room once occupied by paint room

Photo 4
1300 — RCRA pad #1 looking north

Photo 5
1300 — RCRA pad #1 looking west toward rain

Photo 6
1305 — concrete pad w/ solid waste containers (non hazardous waste)



Solution of Right Triangles

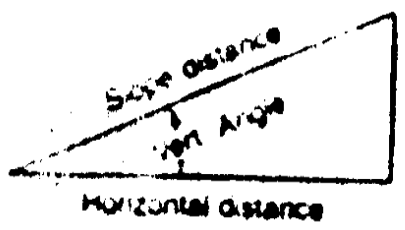
For Angle A: $\sin = \frac{a}{c}$, $\cos = \frac{b}{c}$, $\tan = \frac{a}{b}$, $\cot = \frac{b}{a}$, $\sec = \frac{c}{b}$, $\operatorname{cosec} = \frac{c}{a}$

Given	Required	
a, b	A, B	$\tan A = \frac{a}{b}$; $B = 90° - A$; $c = \sqrt{a^2 + b^2} = a\sqrt{1 + \frac{b^2}{a^2}}$
a	A, B	$\sin A = \frac{a}{c}$; $B = 90° - A$; $b = \sqrt{(c+a)(c-a)} = c\sqrt{1 - \frac{a^2}{c^2}}$
A, a	B, b, c	$B = 90° - A$; $b = a \cot A$; $c = \frac{a}{\sin A}$
A, b	B, a, c	$B = 90° - A$; $a = b \tan A$; $c = \frac{b}{\cos A}$
A, c	B, a, b	$B = 90° - A$; $a = c \sin A$; $b = c \cos A$

Solution of Oblique Triangles

Given	Required		
A, B, a	b, c, C	$b = \frac{a \sin B}{\sin A}$	$C = 180° - (A + B)$; $c = \frac{a \sin C}{\sin A}$
A, a, b	B, c, C	$\sin B = \frac{b \sin A}{a}$	$C = 180° - (A + B)$; $c = \frac{a \sin C}{\sin A}$
a, b, C	A, B, c	$A + B = 180° - C$	$\tan \frac{1}{2}(A - B) = \frac{(a-b)\tan \frac{1}{2}(A+B)}{a+b}$; $c = \frac{a \sin C}{\sin A}$
a, b, c	A, B, C	$s = \frac{a+b+c}{2}$	$\tan \frac{1}{2}A = \sqrt{\frac{(s-b)(s-c)}{s(s-a)}}$; $\tan \frac{1}{2}B = \sqrt{\frac{(s-a)(s-c)}{s(s-b)}}$; $C = 180° - (A + B)$
a, b, c	Area	$s = \frac{a+b+c}{2}$	area $= \sqrt{s(s-a)(s-b)(s-c)}$
A, b, c	Area		area $= \frac{b \cdot c \sin A}{2}$
A, B, C, a	Area		area $= \frac{a^2 \sin B \sin C}{2 \sin A}$

REDUCTION TO HORIZONTAL



Horizontal distance = Slope distance multiplied by the cosine of the vertical angle. Thus slope distance = 319.4 ft. Vert. angle = 5° 10'. From Table Page IX, cos 5° 10' = .9959. Horizontal distance = 319.4 × .9959 = 318.09 ft.

Horizontal distance also = Slope distance minus slope distance times (1 − cos of vertical angle). With the same figures as in the preceding example the following result is obtained. Cosine 5° 10' = .9959. 1 − .9959 = .0041. 319.4 × .0041 = 1.31. 319.4 − 1.31 = 318.09 ft.

When the rise is known, the horizontal distance is also computed by the ...

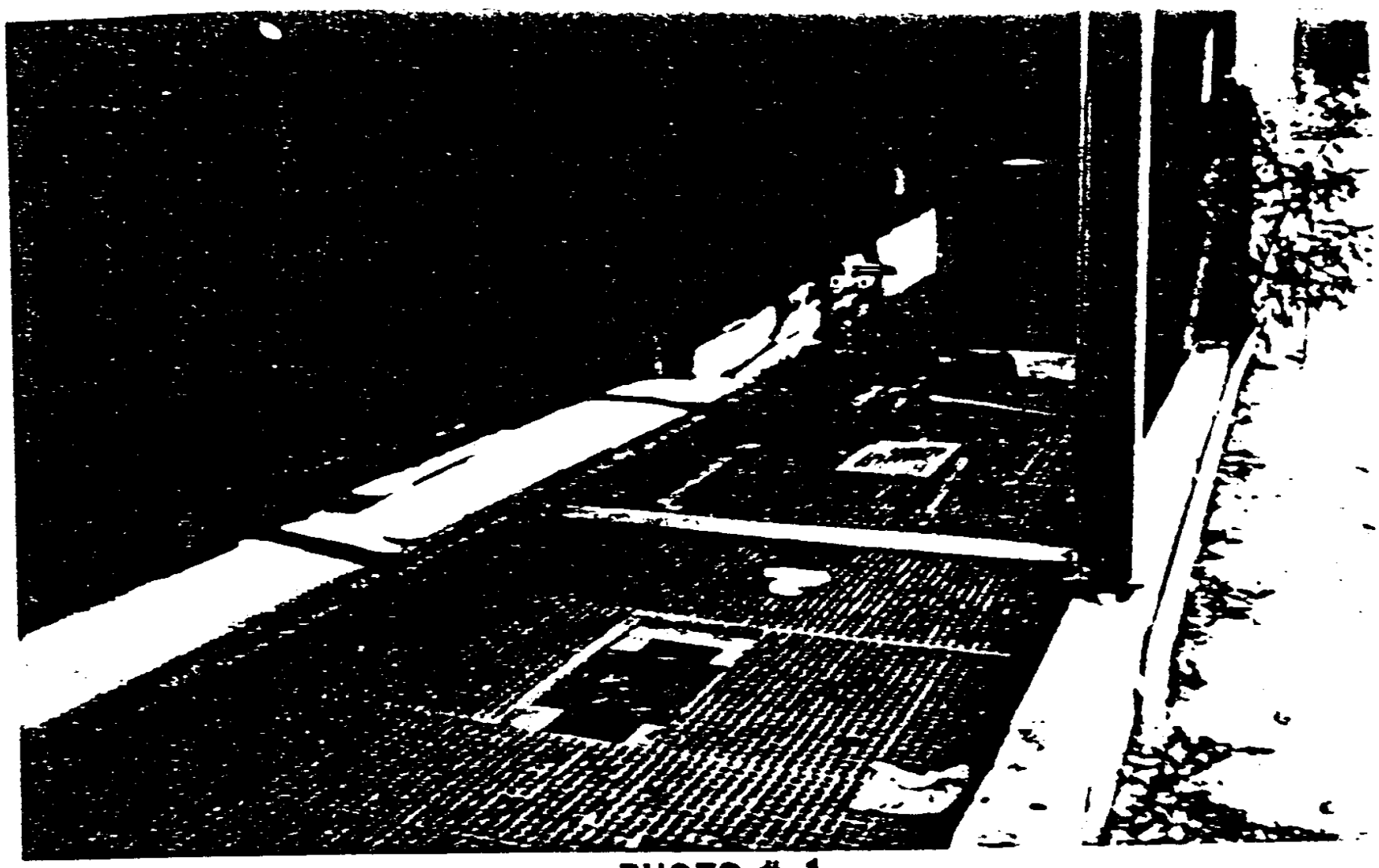


PHOTO # 1

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #1- easterly view of inground holding tanks.

DATE: November 7, 1991 TIME: 1400

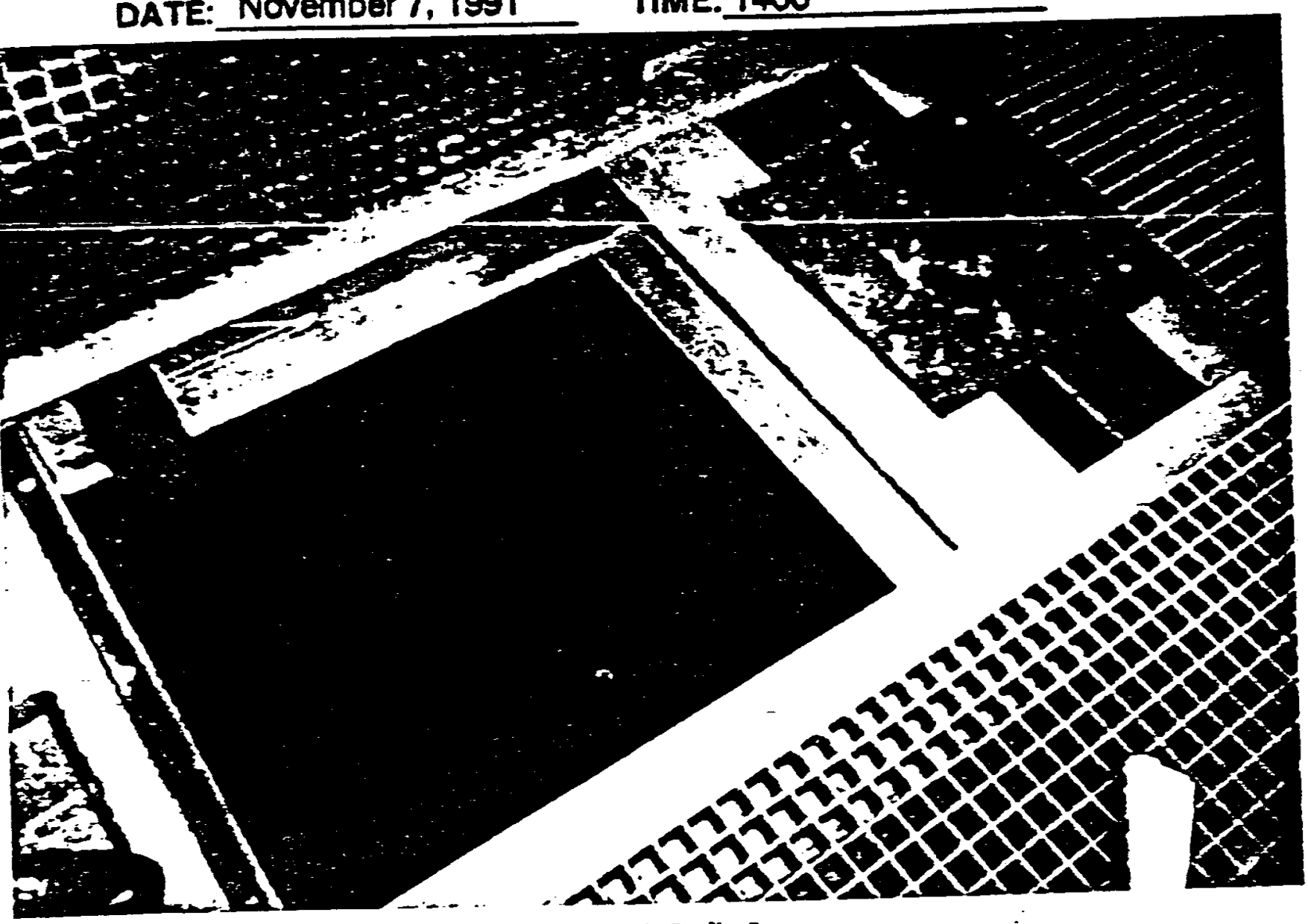


PHOTO # 2

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #1- view inside a section of the sump; no cracks or damp areas evident.
DATE: November 7, 1991 TIME: 1400

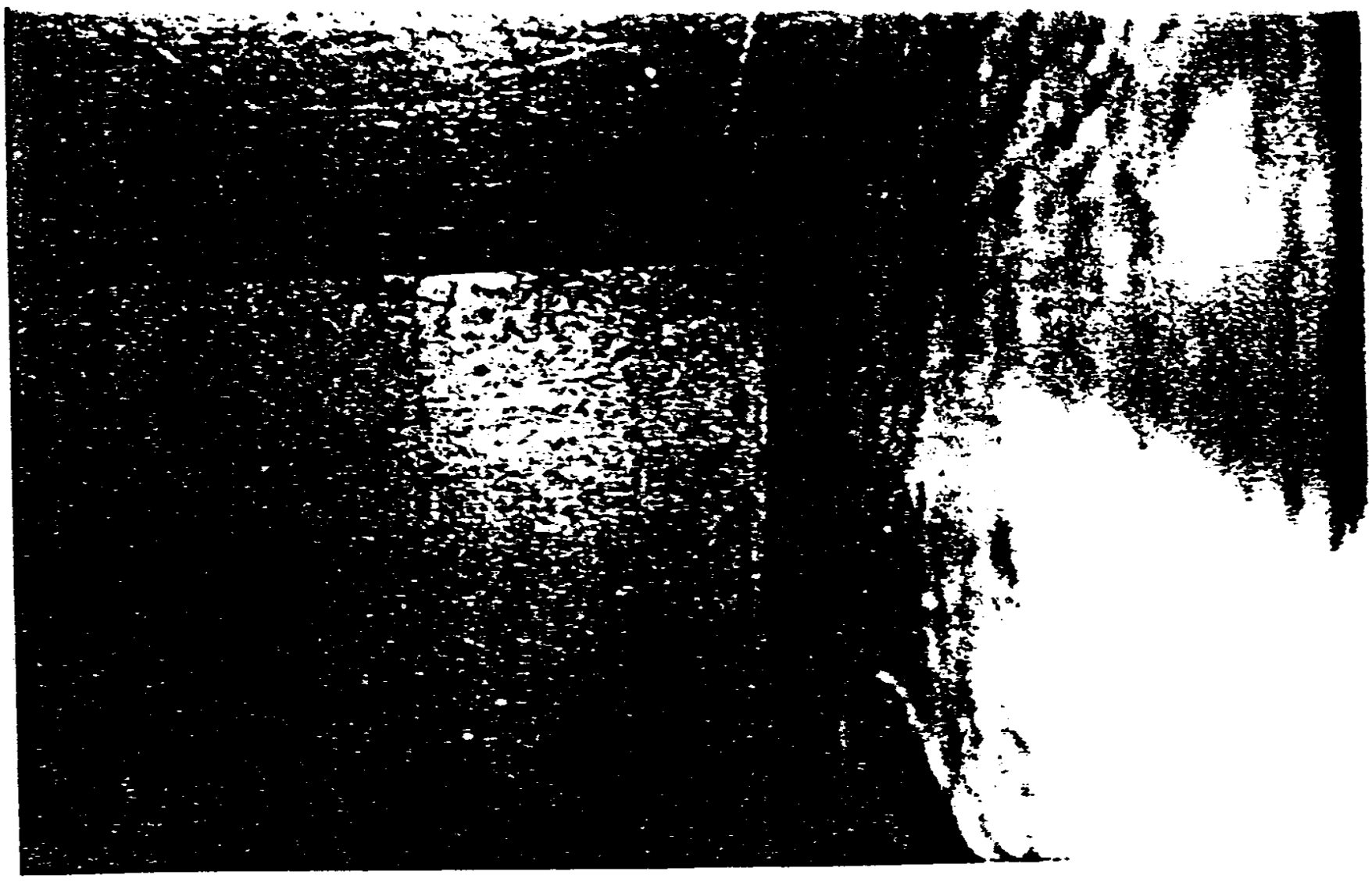


PHOTO # 3

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #1- view inside of one concrete section, no cracks evident.
DATE: November 7, 1991 TIME: 1405

PHOTO # 4

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #2- view of northern entrance to WWTP, office equipment and construction materials in the foreground.
DATE: November 7, 1991 TIME: 1420

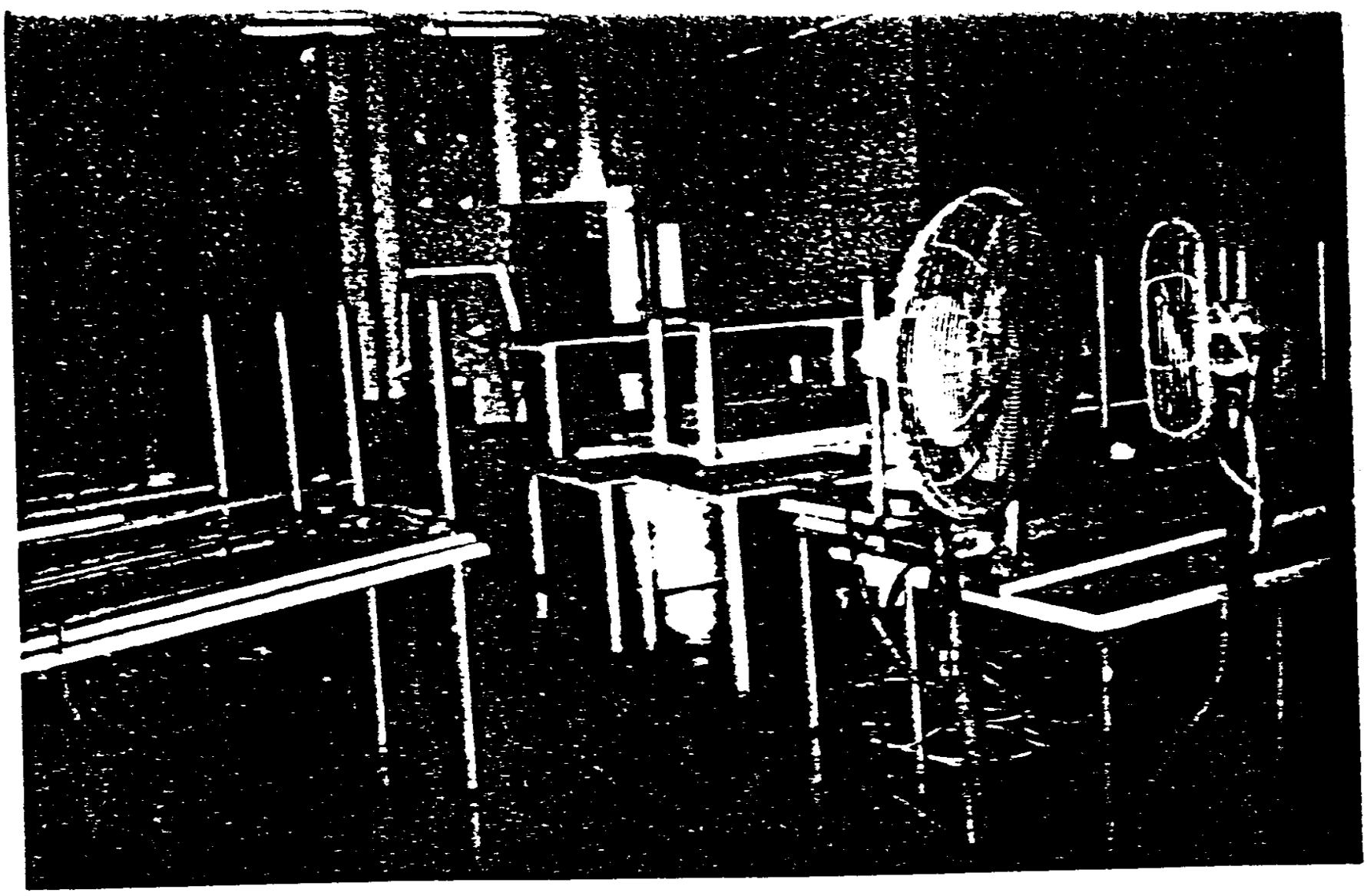


PHOTO # 5

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #2- view of southeastern corner of WWTP, tables in the foreground.
DATE: November 7, 1991 TIME: 1420

PHOTO # 6

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #1- view of southwestern corner of WWTP, tables and building materials in the foreground.
DATE: November 7, 1991 TIME: 1420

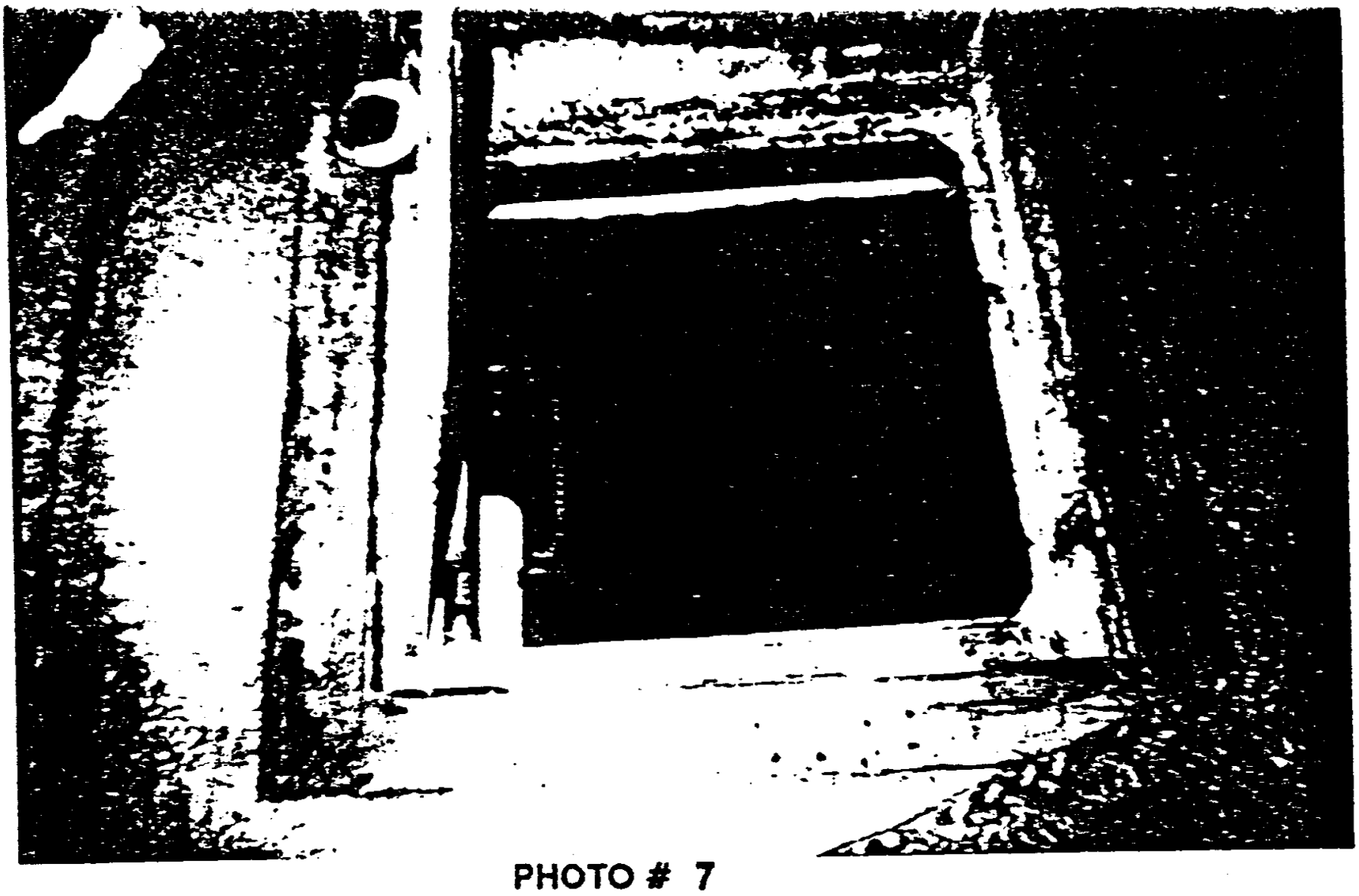


PHOTO # 7

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: SWMU #2- view of the equalization basin, now converted into a chilled water holding basin..

DATE: November 7, 1991 TIME: 1430

PHOTO # 8

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: SWMU #3- view of the concrete containment structure for the etchant tank; the tank was removed in 1990.

DATE: November 7, 1991 TIME: 1350

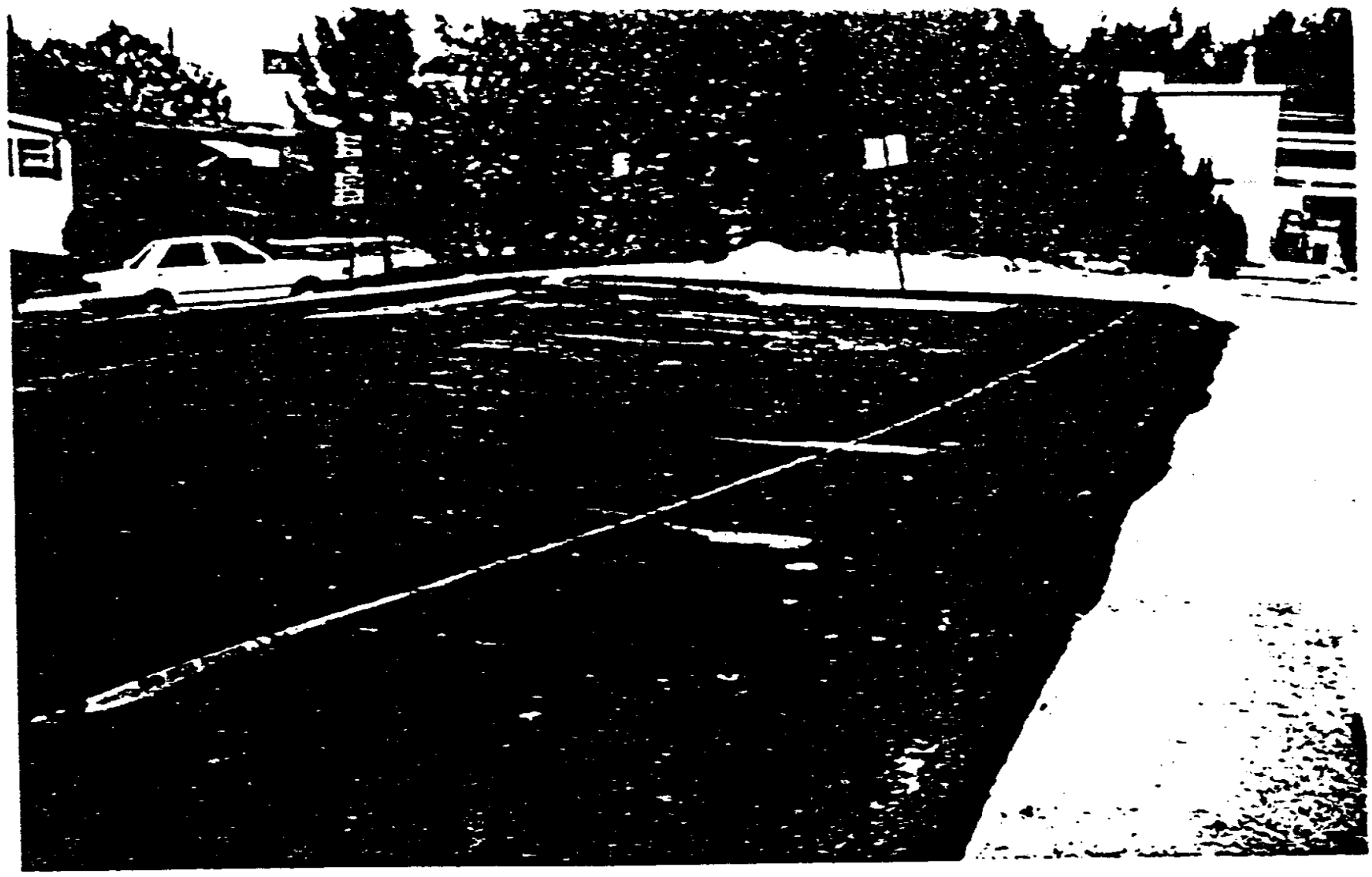


PHOTO # 9

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #4- view of RCRA storage pad #1 looking north, asphalt pad roped off to prevent access.
DATE: November 7, 1991 TIME: 1300

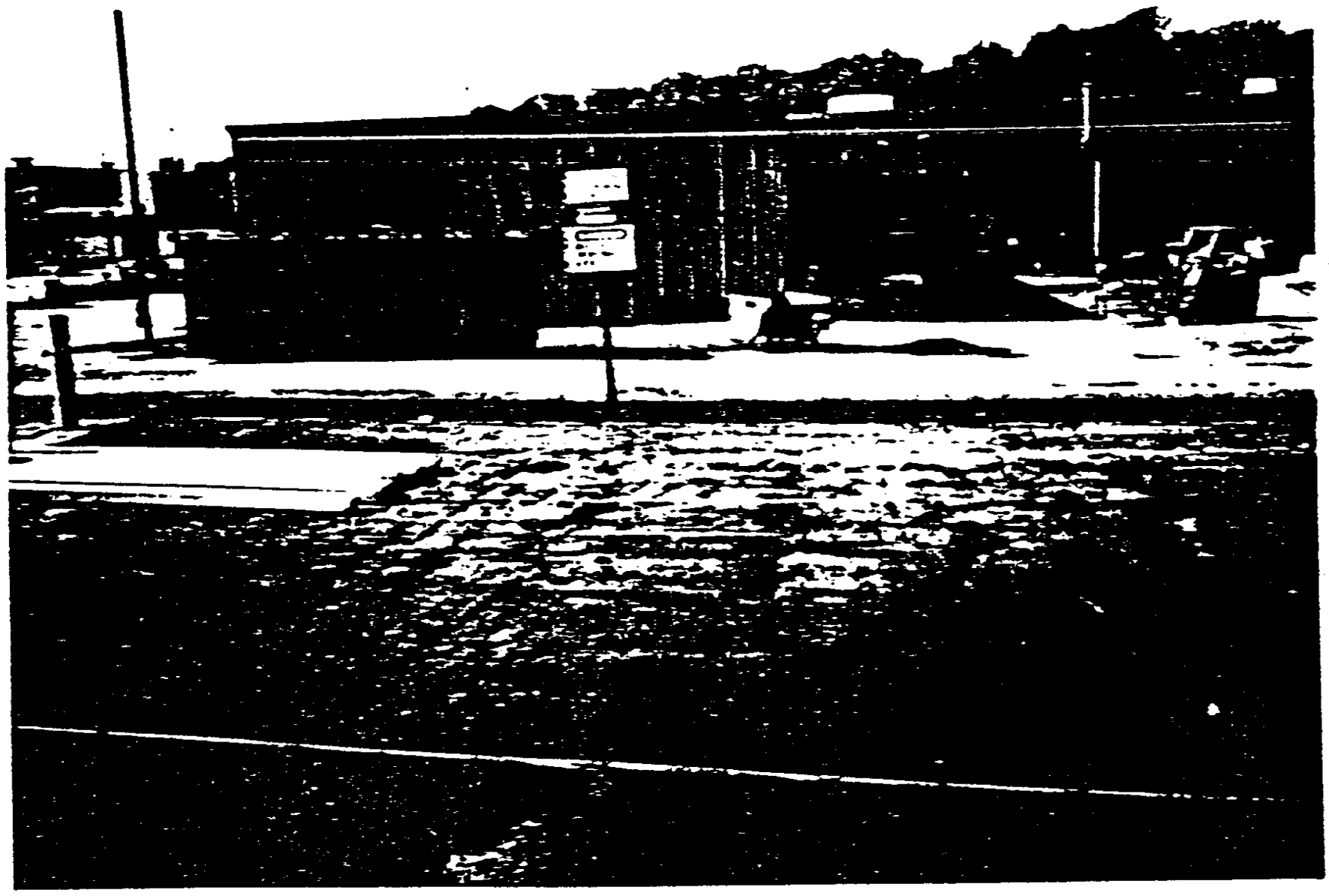


PHOTO # 10

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #4- view of RCRA storage pad #1 looking west, boreholes remaining from 1991 sampling investigation.
DATE: November 7, 1991 TIME: 1300

PHOTO # 11

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: SWMU #5- view of sludge containment area, metal container stores non-hazardous wastes.

DATE: November 7, 1991 TIME: 1305

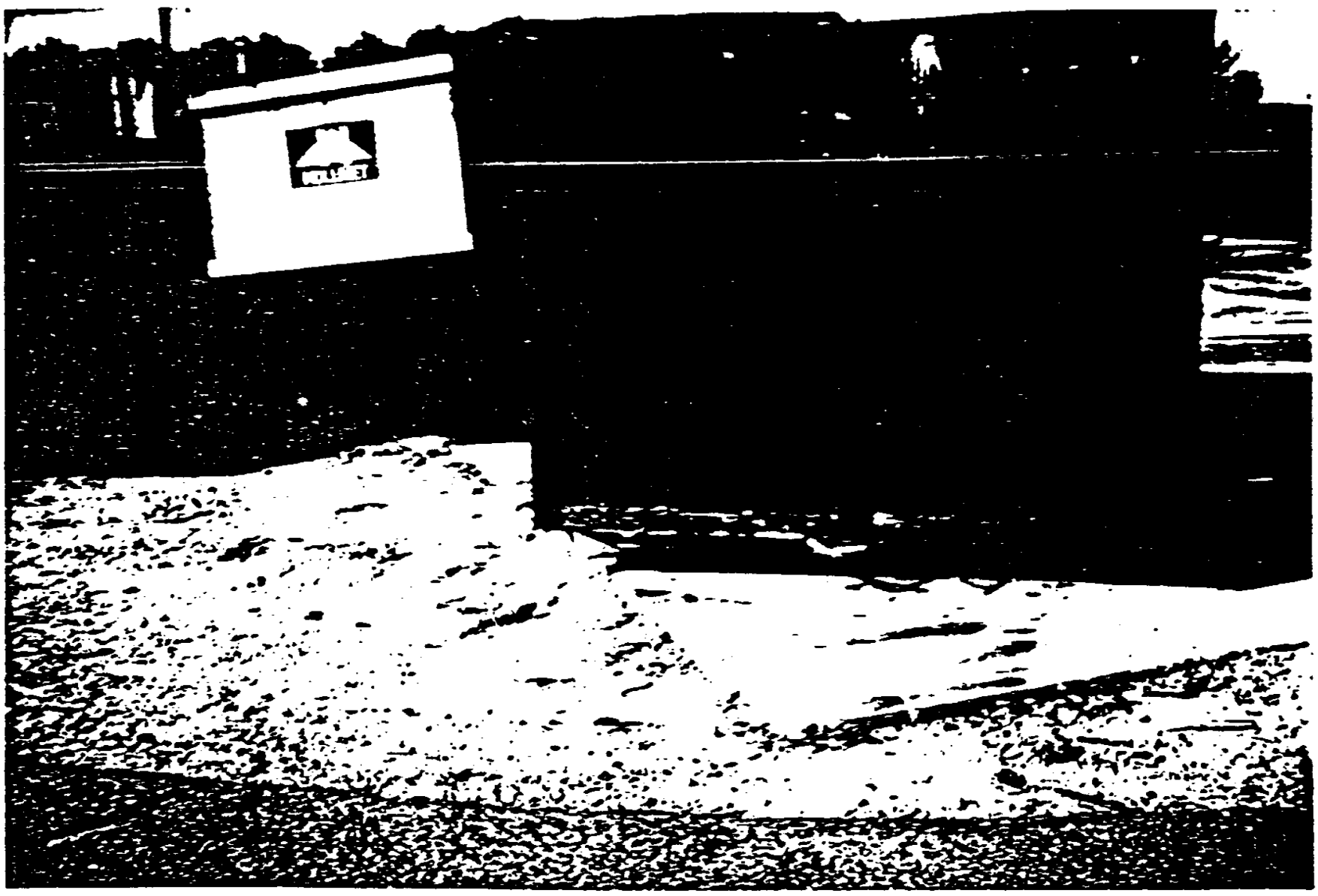


PHOTO # 12

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: SWMU #5- view of metal containers storing non-hazardous wastes from office usage and cafeteria.

DATE: November 7, 1991 TIME: 1305

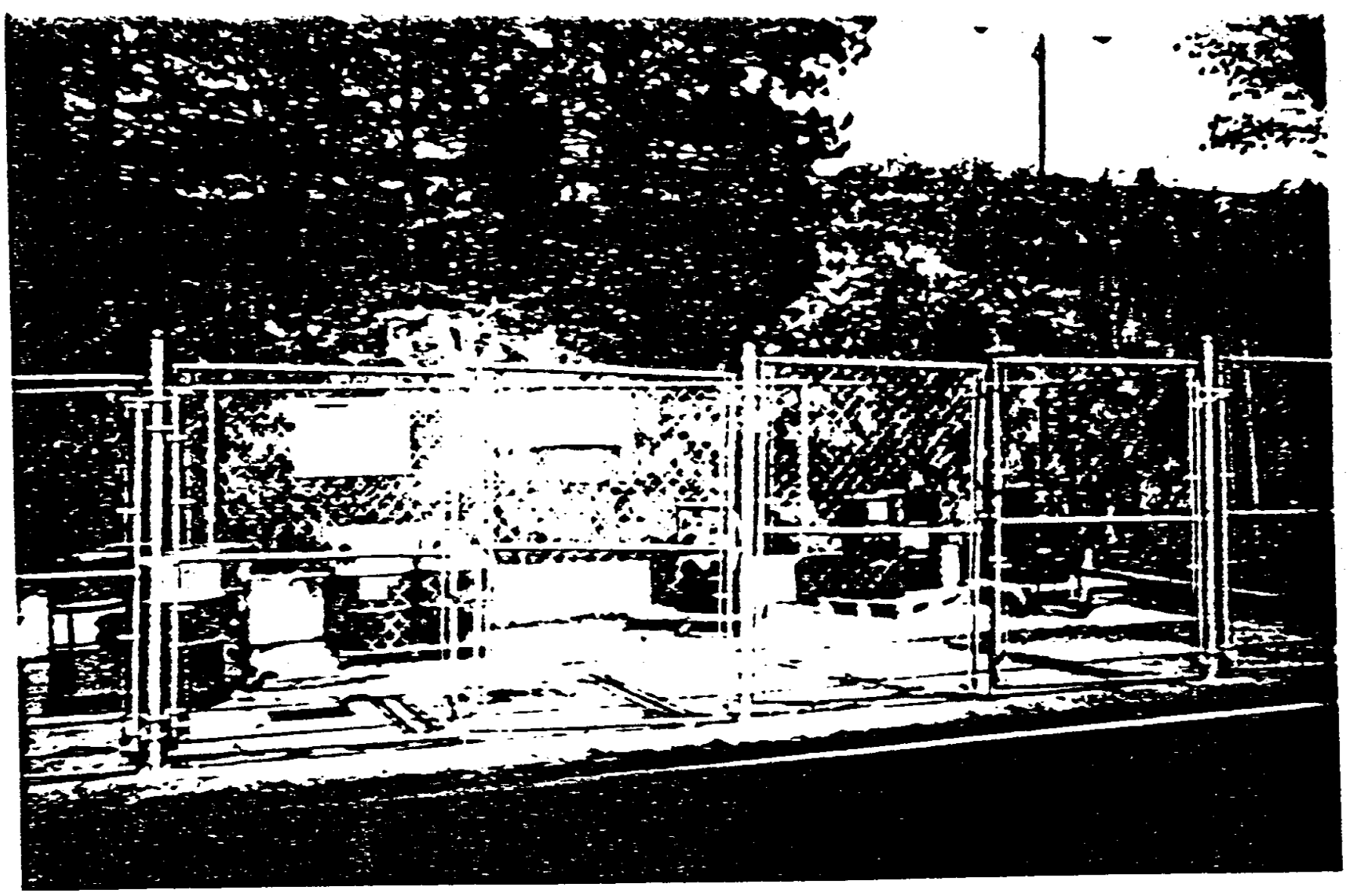


PHOTO # 13

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: SWMU #6- view of RCRA storage pad #2 looking north, drums present onsite.

DATE: November 7, 1991 TIME: 1310

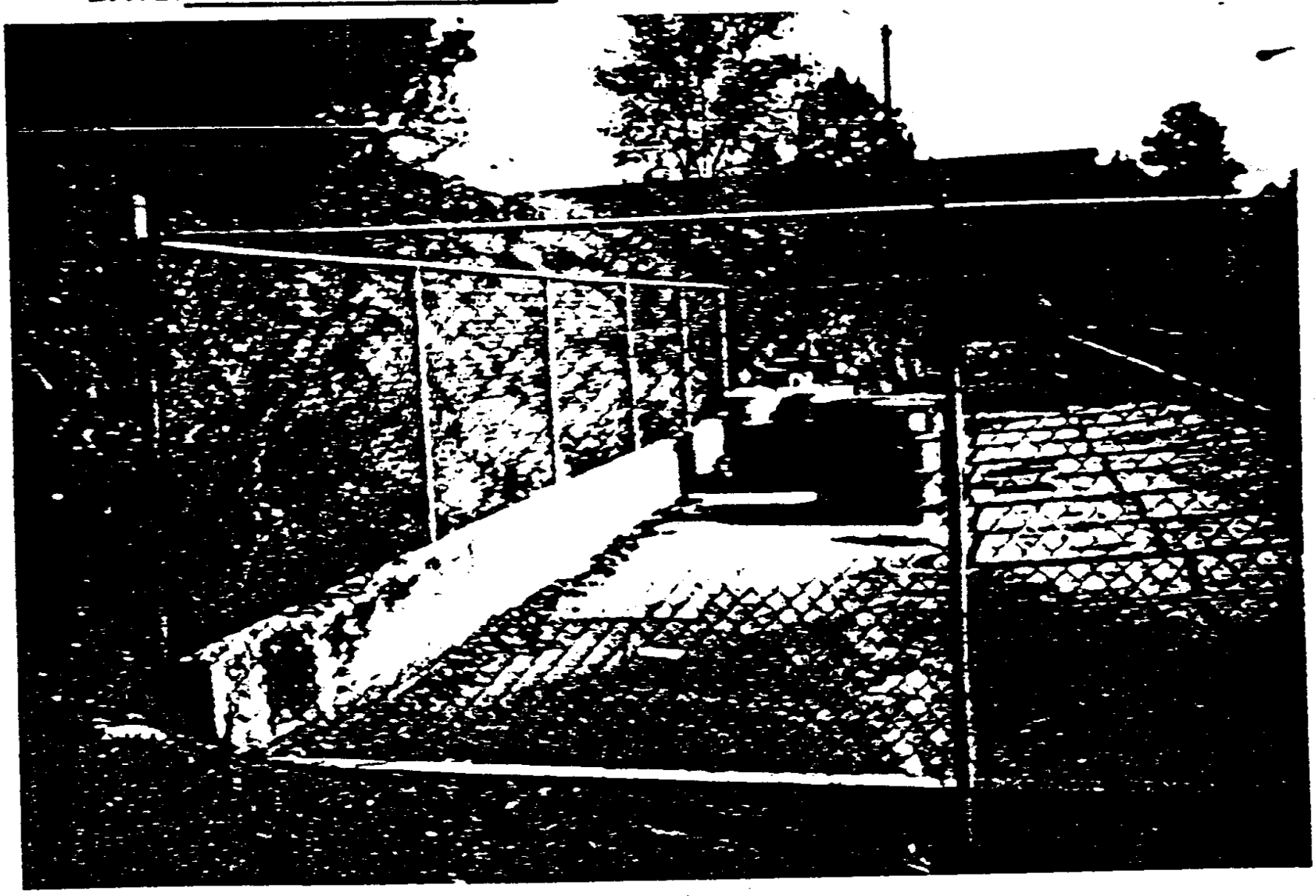


PHOTO # 14

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: SWMU #6- view of drums and the pad's slope toward the locked drainage valve.

DATE: November 7, 1991 TIME: 1310

PHOTO # 15

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #6- view of surface water drain lines underneath the pad, which directs surface water runoff beyond unit.
DATE: November 7, 1991 TIME: 1315

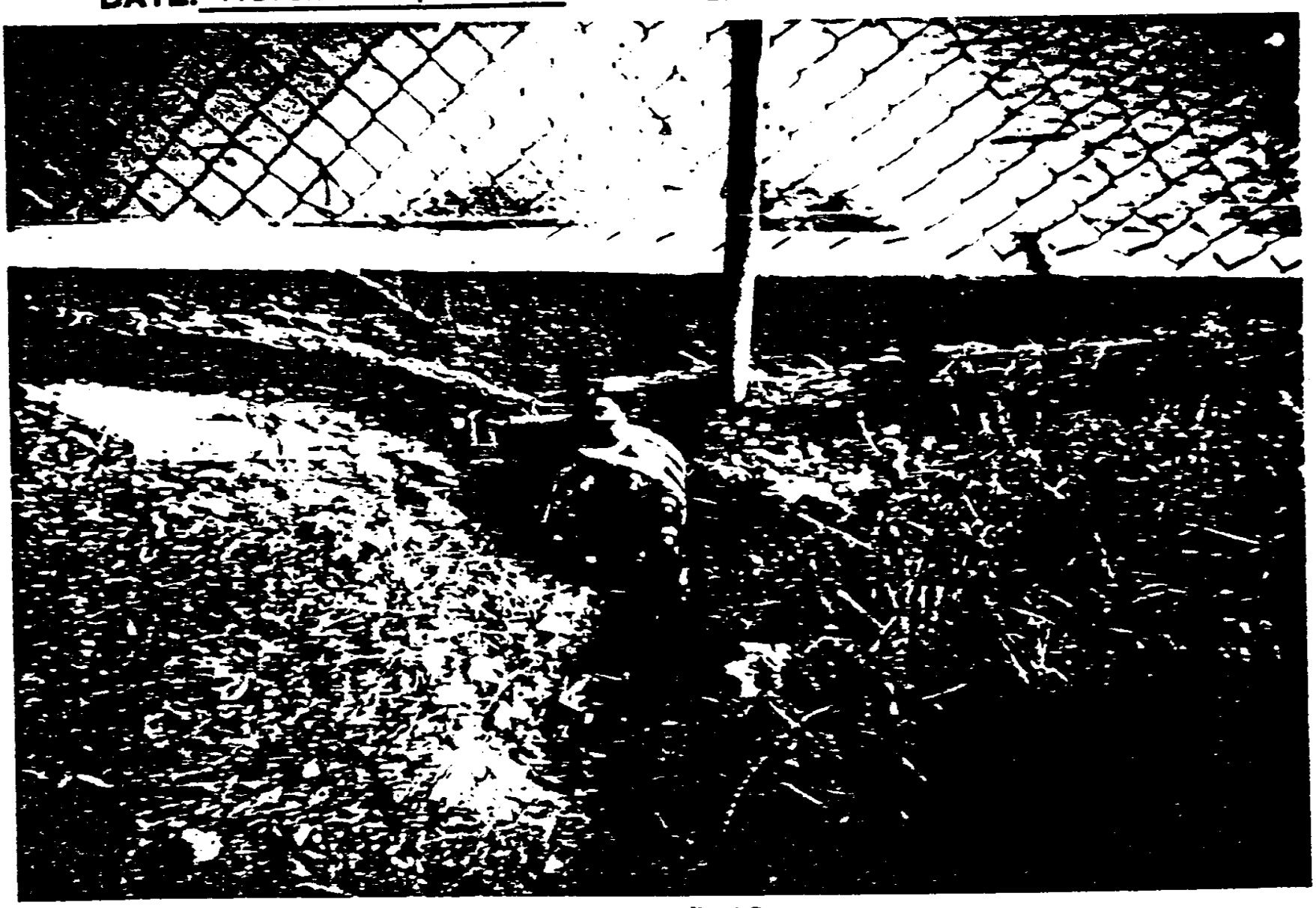


PHOTO # 16

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: SWMU #6- locked drainage valve at RCRA storage pad #2.
DATE: November 7, 1991 TIME: 1317

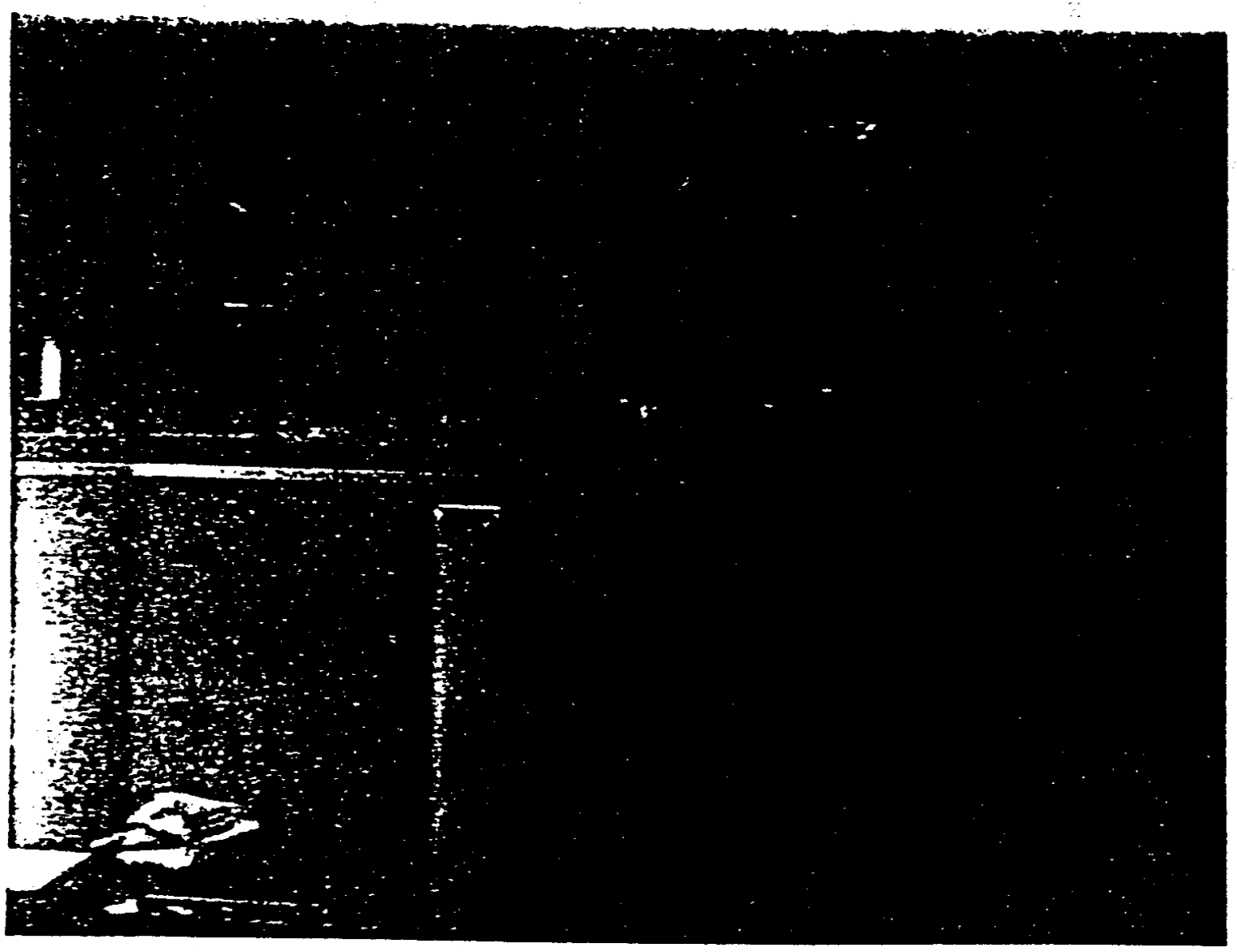


PHOTO # 17

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: office area located in the northeastern portion of the main facility, past location of the wet processing and copper plating areas.
DATE: November 7, 1991 TIME: 1220

PHOTO # 18

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: printing room area, past location of the electroless copper plating line.
DATE: November 7, 1991 TIME: 1230

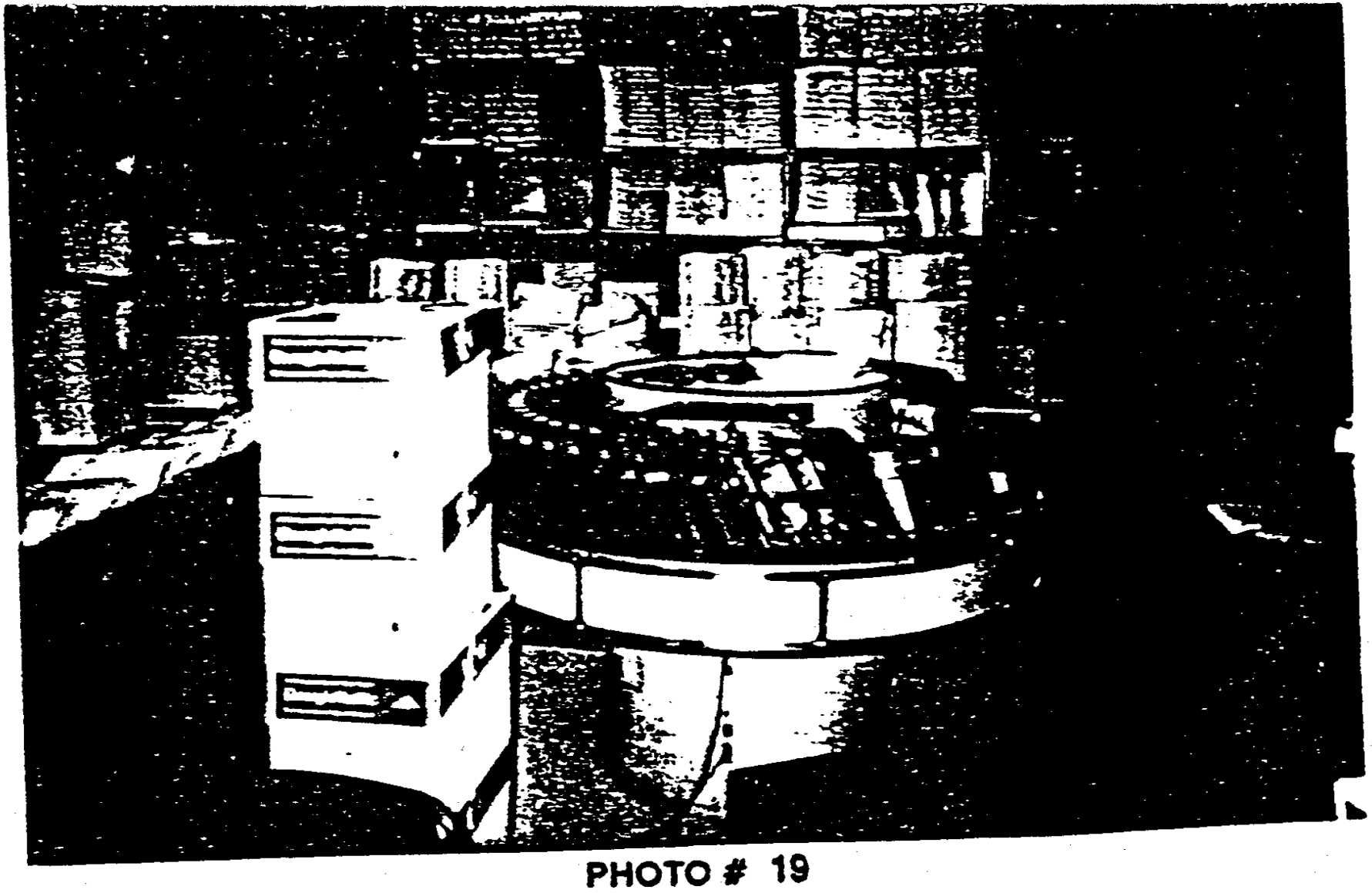


PHOTO # 19

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: copying area, approximate past location of paintroom; located in the northeastern portion of the main facility.

DATE: November 7, 1991 TIME: 1235

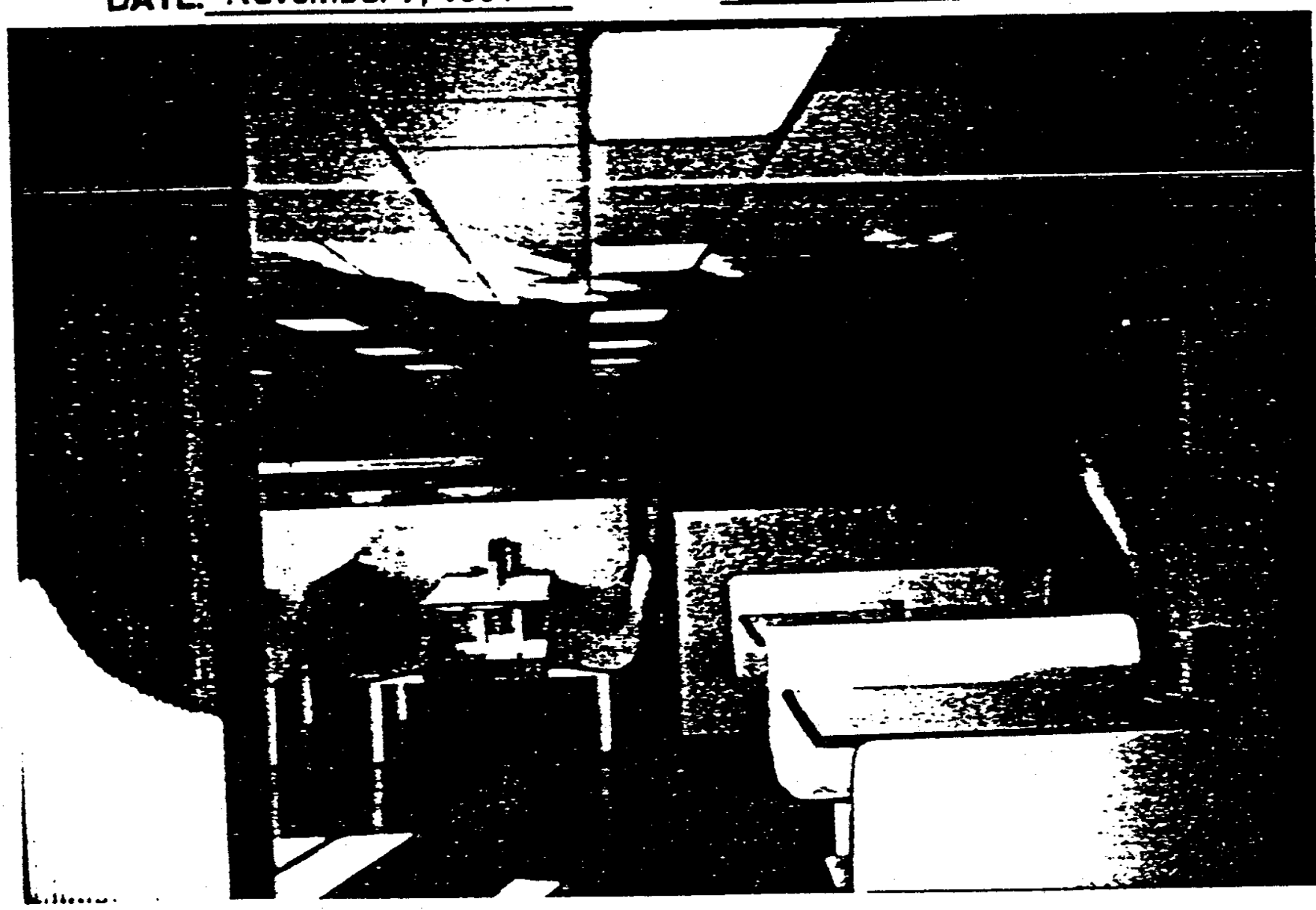


PHOTO # 20

SITE: Alcatel Network Systems LOCATION: Raleigh, NC

DESCRIPTION: cafeteria, past location of silk screening room and electroless copper plating line.

DATE: November 7, 1991 TIME: 1440

PHOTO # 21

SITE: Alcatel Network Systems **LOCATION:** Raleigh, NC

DESCRIPTION: AOC- concrete alleyway next to a loading/unloading pad, location of contaminated soil (area #1).

DATE: November 7, 1991 **TIME:** 1337

PHOTO # 22

SITE: Alcatel Network Systems **LOCATION:** Raleigh, NC

DESCRIPTION: AOC- concrete alleyway facing east, located north of main facility; location of contaminated soil (area #2).

DATE: November 7, 1991 **TIME:** 1340

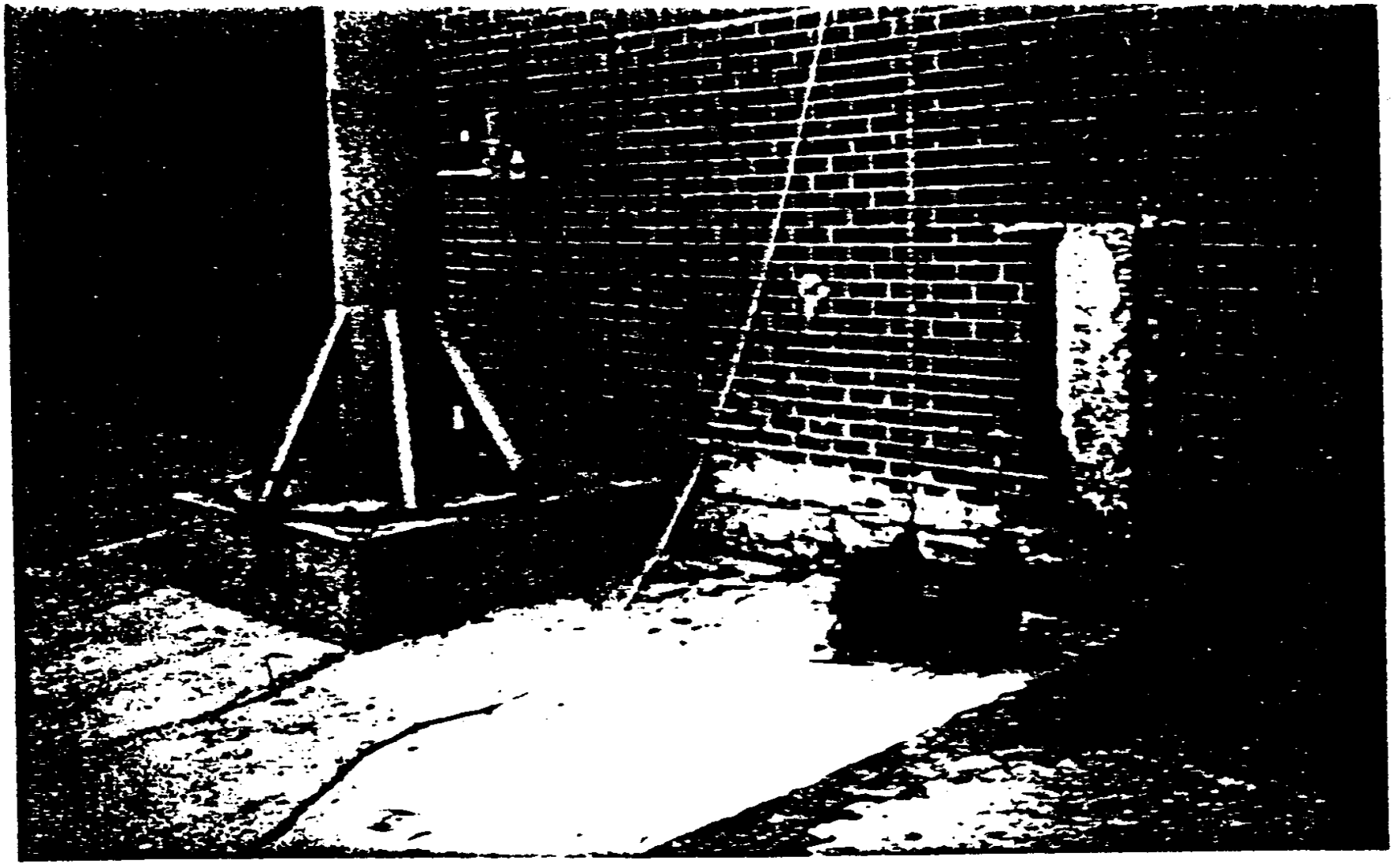


PHOTO # 23

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: AOC- drainage exit from main facility, nearest exit to WWTP; approximate location of area #2.
DATE: November 7, 1991 TIME: 1340

PHOTO # 24

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: AOC- concrete alleyway facing west; view of contaminated soil area (area #3); location is 40'-50' northeast of area #1.
DATE: November 7, 1991 TIME: 1330

PHOTO # 25

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: AOC- past location of chemical storage shed; soil investigation area (area #4).

PHOTO # 26

SITE: Alcatel Network Systems LOCATION: Raleigh, NC
DESCRIPTION: AOC- boreholes in asphalt; evidence of soil investigation conducted at area #4.
DATE: November 7, 1991 TIME: 1335

APPENDIX B

TOPOGRAPHIC MAP OF ALCALTEL FACILITY

APPENDIX C

ENVIRONMENTAL CLEANUP, AREA NO. 1 WEGS
ALCATEL NETWORK SYSTEM
MAY 1990

APPENDIX D

ENVIRONMENTAL CLEANUP, AREA 2, WEGS
ALCATAL NETWORK SYSTEM
MAY 1990

APPENDIX D

WELL LOGS, WELL DATA AND SAMPLING OF MONITORING WELLS 6, 7, 8, 9 OCTOBER 1990

APPENDIX F

ENVIRONMENTAL CLEANUP, AREA NO. 2 ADDENDUM WEGS
ALCATEL NETWORK SYSTEM
JUNE 1991