UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

AKA "Proposed Plans"

SUBJECT: RCRA Statement of Basis
AT&T Microelectronics
Richmond, Virginia

DATE: MAY 16 1991

FROM: Bruce P. Smith, Director
Office of Hazardous Programs (3HW03)

VAD066000993

TO: Thomas C. Voltaggio, Director
Hazardous Waste Management Division (3HW00)

Recommended Action:

Sign the attached RCRA Statement of Basis.

Purpose of Statement of Basis:

This Statement of Basis (SOB) provides EPA's justification for the Agency's preliminary selection of the preferred corrective measures alternative for AT&T, Richmond Works facility. The SOB briefly summarizes the results of the Corrective Measures Study (CMS) prepared by AT&T, discussing each corrective measure alternative presented in the CMS, and provides EPA's rationale for its preliminary selection.

A workgroup consisting of the RCRA Project Manager (Kai Hon Shum), a RCRA hydrogeologist (Joel Hennessy), two RCRA toxicologists (Kathy Shelton and Sam Rotenberg), a RCRA permit writer (Mary Beck), and a Superfund Project Manager (Ann DeLong), reviewed and commented on AT&T's CMS reports, which consisted of four (4) proposed corrective measure alternatives (CMAs). The workgroup utilized the following decision criteria (delineated in Headquarters draft SOB guidance document) to evaluate each of the proposed CMAs: long-term reliability and effectiveness, reduction of toxicity, mobility, or volume of wastes, short-term effectiveness, implementability and cost. The workgroup's preferred selection is CMA-6. CMA-6 is preferred because it presents the most expeditious alternative for contaminant remediation.

Future Actions:

Upon signature by the Division Director, the SOB and all other relevant or supporting documents (the RCRA Facility Investigation, the CMS) will be made available to the public for comment. This public comment will last thirty (30) days. There will also be a public meeting on the last day of the public comment period. After the public comment period, EPA will, depending on the nature of substantive public comment, either revise the corrective measure alternative, select a different corrective measure alternative, or finalize its decision on EPA's preferred corrective measure alternative and prepare a Response to Comments addressing substantive public comment on EPA's preferred corrective measure alternative. EPA will then prepare a RCRA Record of Decision (ROD) for the final corrective measure alternative and make both the RCRA ROD and this, EPA and AT&T will begin negotiation of a RCRA Section 3008(h) consent order requiring implementation of the final corrective measure alternative.

Significance of this Statement of Basis:

This is Region III's third SOB developed and presented for public comment.

EPA STATEMENT OF BASIS
AT&T Richmond Works
4500 Laburnum Avenue
Richmond, VA 23231

Purpose of EPA's Statement of Basis

On September 15, 1989, EPA and AT&T Technologies, Inc., now known as AT&T Microelectronics (AT&T) entered into a Consent Order pursuant to Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6928(h). Under the terms of this Consent Order, AT&T was required to complete an on-site and off-site investigation in order to determine the nature and extent of contamination from the AT&T Richmond Works located at 4500 Laburnum Avenue, Henrico County, Richmond, Virginia (Facility or Richmond Works) and to conduct a study which evaluates various clean-up alternatives.

AT&T has completed these investigations and has submitted to EPA for approval a Hydrogeological Investigation Draft Phase III Final Report, which is the functional equivalent of a RCRA Facility Investigation (RFI) report and a Corrective Measures Study (CMS), which evaluated the use of several remedial technologies. In addition, eight (8) Corrective Measures Alternatives (CMAs) were evaluated in detail for contaminant remediation.

This Statement of Basis describes the eight CMAs and presents EPA's justification for making a preliminary decision regarding one of the preferred Corrective Measures Alternatives proposed by AT&T for the Facility. This document will summarize the findings of the contaminant investigations and the Corrective Measures Study conducted by AT&T as well as EPA's rationale for its preliminary decision regarding the selection of the EPA preferred Corrective Measure.

EPA welcomes public comment on all the eight (8) CMAs described on this document. Public input on all CMAs, and on the information that supports the CMAs, is an important contribution to the remedy selection process. Public comments can influence EPA's final selection of a CMA that would be implemented either through a Corrective Measure Implementation (CMI) Administrative Order or a judicial order.

This document highlights certain information presented in the Hydrogeologic Investigation Draft Phase III Final Report and the Administrative Record, but does not serve as a substitute for these documents. Persons desiring more complete information regarding the proposed corrective action should consult the EPA Project Coordinator, Kai Hon Shum, at the address/telephone number given on page 11 of this document, and the Hydrogeologic Investigation Phase I, II and III reports and Administrative Record, a copy of which is available for review at the offices of EPA Region III, 841 Chestnut Building, Philadelphia,

Pennsylvania, and at the Richmond Public Library, Business, Science, and Technology Department, 101 East Franklin, Richmond, Virginia. Comments on this document or on any of the CMAs may be sent to the attention of Mr. Shum.

Background

AT&T Richmond Works, is located in eastern Henrico County, Virginia. The Facility is bounded on the north by Interstate 64 (I-64), and on the southwest by South Laburnum Avenue. North of I-64 is Gillie Creek, which generally flows from east to west. A map showing the location of the Facility is provided as Attachment 1.

The Facility covers approximately 120 acres in a mixed residential, commercial, and industrial area. The primary business conducted at the Richmond Works is the manufacturing of printed circuit boards using a wide range of electroless/ electroplating, etching and coating processes.

In 1986, during the repair of a fire main, AT&T discovered what it believed to be releases of organic substances. In March 1987, Camp, Dresser and McKee ("CDM") was engaged by AT&T to conduct a hydrogeological investigation and analysis at the Facility. AT&T began soil gas, well water and surface water sampling in May 1987 ("Phase I" Investigation). The soil gas analyses showed the presence of 1,1,1-trichloroethane ("TCA") and methylene chloride ("MEC") near the solvent tank farm and the solvent recovery area of the Facility. The soil surrounding the solvent tank farm was excavated and pipes were replaced and in the latter case a sump in the solvent recovery area was repaired. Samples of groundwater from the Facility and surface water in Gillie Creek have shown to contain chlorinated organic compounds.

To date, AT&T has completed Phases I, II and III (the Phase II and III of the Hydrogeological Investigation were continuations of the Phase I Hydrogeological Investigation) of its Hydrogeologic Investigation, which included the installation of 35 groundwater monitoring wells on-site, and 2 groundwater monitoring wells off-site. After having satisfied all the requirements of a RCRA Facility Investigation (RFI) and a Corrective Measures Study (CMS) thru completion of the Phase I-III Hydrogeologic Investigation, EPA approved AT&T's Phase I, II, and III Hydrogeologic Investigation as the equivalent of an RFI/CMS for the Facility.

The results of the Hydrogeologic Investigations conducted by AT&T have shown that:

1. The Facility is underlain by two known water bearing zones which lie between clay layers. The surface clay layer extends approximately 15 feet beneath the surface, followed by the surficial water bearing zone that is an average of 20 feet in thickness. Beneath the surficial water bearing zone is a clay layer approximately 200 feet thick, underlain by the second water bearing zone, located in the Patuxent Formation. Contamination from the Facility's previous operations have impacted the surficial water bearing zone, which is not used as a water supply. To date, the major producing aquifer in the Patuxent Formation, where the municipal water supply is drawn, has not been impacted.

2. The volatile organic compounds ("VOCs") found in soil and in groundwater consists of TCA, MEC, 1,1-dichloroethane ("DCA"), and 1,1-dichloroethene ("DCE"). The VOCs found in surface water near the Facility consist of TCA, DCA and DCE.

3. Soil, surface water, and groundwater have been impacted by VOCs. Based on sampling results from March 1989, the highest concentration of VOCs in groundwater was 1229 parts per million ("ppm"), based on sampling results from October, 1989, the highest concentration of VOCs in soil was 35 ppm, and based on sampling results from March, 1989, the highest concentration of VOCs in surface water was from a seep which had a concentration of 1.3 ppm. That seep is located in a storm drain which feeds into Gillie Creek.

4. The area off-site of the Facility, north of I-64, adjacent to Gillie Creek, has been designated as wetlands. A biota assessment was conducted at these wetlands. This assessment revealed that there is no adverse effect on the wetlands from the release of VOCs from the Richmond Works.

Additional information regarding the characterization and distribution of VOCs in the groundwater, surface water, and the soil, may be found in the Administrative Record. A map showing the location of all monitoring wells and extent of groundwater contamination is provided as Attachment 2.

Scope of Corrective Action

The Corrective Measures Alternatives planned for the Facility will remediate the soil, groundwater, and surface water. The VOCs in the soil are below EPA health-based levels therefore the contaminated soil will be remediated by the flushing mechanism of infiltrated rain water. Groundwater will be remediated by pumping and treatment technology. Groundwater from

the Facility recharges into Gillie Creek as surface water. Therefore Gillie Creek will be remediated when the remediation groundwater is remediated.

Description of the Corrective Measure Alternatives

Initially AT&T evaluated five methods of remediating the contaminants at the Richmond Works. These five methods for remediation are: natural attenuation, barrier wall containment, groundwater pumping and treatment, soil gas extraction, and soil excavation and treatment. Upon evaluation of all these methods of remediation, AT&T concluded, with the concurrence of EPA, that groundwater pumping and treatment from the surficial water bearing zone alone is the preferred method of remediation, because the other technologies would be less effective in remediating groundwater at this Facility. With the exception of natural attenuation (i.e., the no action alternative), all eight (8) Corrective Measure Alternatives (CMAs) that AT&T proposed, utilize the groundwater pumping and treatment method of remediation.

Contaminated groundwater will be pumped from extraction wells and from the abandoned electrical man-hole. The treatment of contaminated groundwater will involve air-stripping, and to prevent cross-media contamination, the resultant off-gases from the air-stripper will be passed through a granulated activated carbon unit. The emissions from the air stripper and from the granulated activated carbon unit will comply with the requirements of the Clean Air Act, 42 U.S.C. §§ 7401-7642, as amended. The treated groundwater will be fed into the Facility's existing air scrubbers and/or boilers, and will be used as non-contact cooling water in the existing cooling towers.

In each of the groundwater pump and treat CMAs below, additional pumping from the abandoned electrical man-hole (EM-4) has been proposed because contaminated water collects in the man-hole. Upon the approval from the U.S. Environmental Protection Agency, AT&T may also use the abandoned man-hole, EM-4, as a point of injection of treated groundwater into the surficial water bearing zone. The injection of the treated groundwater into the surficial water bearing zone will increase hydraulic gradients near the source of contamination, will aid in the flushing of contaminants trapped within the contaminated soil, and may result in a shorter time for complete remediation at the Facility. Pumping contaminated groundwater from the electrical man-hole will cease when injection begins. However, until such permission is expressly obtained from EPA, AT&T shall remove contaminated water that collects inside the abandoned man-hole, EM-4, and treat it as described above.

CMA-1, the no action alternative, utilizes remediation through natural attenuation alone. It has been used as a

reference for comparing the performance of the other seven CMAs. Each of the other seven CMAs (i.e., CMA-2, CMA-3, CMA-3A, CMA-3B, CMA-4, CMA-5, and CMA-6) are alternatives which require the pumping and treatment of groundwater. These CMAs differ in the number and in the configuration of extraction wells. A groundwater and surface water sampling and analyses program is also included in each CMA. The eight (8) alternatives are discussed in more detail below.

CMA-1 (page 000242 of the Administrative Record)

CMA-1, is an alternative for remediation that relies solely on natural attenuation. This alternative has not been selected by EPA because remediation through natural attenuation alone is the least effective of all the other seven CMAs. In addition, contaminated groundwater will continue to discharge into Gillie Creek.

CMA-2 (page 000242 of the Administrative Record)

The components of CMA-2 consist of: the extraction of groundwater from four (4) groundwater extraction wells located near the source of contamination and the extraction of water collected in the abandoned electrical man-hole, EM-4. An illustration of the orientation of the groundwater extraction wells for CMA-2 is shown in Attachment 3. This alternative is not recommended by EPA because the groundwater capture zone in this alternative is the smallest among all the other CMA's. Therefore, significant portions of the groundwater contaminant plume could not be captured and remediated. For this reason, CMA-2 has not been initially selected as EPA's preferred CMA.

CMA-3 (page 000242 of the Administrative Record)

CMA-3 consists of: the extraction of groundwater from four (4) groundwater extraction wells located near the source of contamination, the extraction of groundwater from three (3) groundwater extraction wells located near the northeastern boundary of the Richmond Works, and the extraction of water collected in the abandoned electrical man-hole, EM-4. An illustration of the orientation of groundwater extraction wells for CMA-3 is shown in Attachment 4. Based on computer generated groundwater modeling, this alternative, if implemented, could not capture contaminated groundwater in the northwestern portion of the groundwater contaminant plume. For this reason, CMA-3 has not been initially selected as EPA's preferred CMA.

CMA-3A (pages 001221 to 001222 of the Administrative Record)

CMA-3A consists of: four (4) groundwater extraction wells located near the source of contamination, three (3) groundwater

extraction wells located near the northeastern boundary of the Richmond Works, four (4) groundwater extraction wells located off-site on the boundary of I-64, directly opposite from the northwestern boundary of the Richmond Works, and the extraction of water collected in the abandoned electrical man-hole, EM-4. An illustration of the orientation of groundwater extraction wells for CMA-3A is shown in Attachment 5. Because the groundwater extraction wells are located very near the wetlands there exists a possibility that the wetlands, an ecologically sensitive area will be disturbed. Although, groundwater modeling demonstrates that this alternative will capture more contaminated groundwater than CMA-6, the orientation of the groundwater extraction wells will cause the destruction of the wetlands. Therefore this alternative has not been initially selected as EPA's preferred CMA.

CMA-3B (pages 001222 to 001223 of the Administrative Record)

CMA-3B consists of: four (4) groundwater extraction wells located near the source of contamination, three (3) groundwater extraction wells located near the northeastern boundary of the Richmond Works, five (5) groundwater extraction wells located off-site in the wetlands by Gillie Creek, and includes the extraction of water collected in the abandoned electrical man-hole, EM-4. An illustration of the orientation of the groundwater extraction wells for CMA-3B is shown in Attachment 6. This remedy, if implemented will disturb the wetlands, which is an ecologically sensitive area. In addition, due to the natural erosion of the surficial water bearing zone near Gillie Creek, the surficial water bearing zone at the proposed location of the extraction wells is very thin (no more than several feet thick), which makes groundwater extraction infeasible. For these reasons, CMA-3B has not been initially selected as EPA's preferred CMA.

CMA-4 (page 001150 of the Administrative Record)

CMA-4 consists of: the extraction of groundwater from eight (8) groundwater extraction wells, to be spaced along the entire northern boundary of the Richmond Works, and the extraction of water collected in the abandoned electrical man-hole, EM-4. An illustration of the orientation of the groundwater extraction wells is shown in Attachment 7. This alternative has not been initially selected by EPA because groundwater modeling demonstrates that the remedy is not as effective in capturing contaminated groundwater near the source of the contamination as the other alternatives which include extraction wells that are located near the source of the contamination. Therefore, CMA-4 has not been initially selected as EPA's preferred alternative.

CMA-5 (page 001150 of the Administrative Record)

CMA-5 consists of: the extraction of groundwater from eight (8) groundwater extraction wells, in the same orientation as CMA-4, the extraction of groundwater from four (4) groundwater extraction wells near the source of contamination, and the extraction of water collected in the abandoned electrical man-hole, EM-4. An illustration of the orientation of the groundwater extraction wells is shown in Attachment 8. Based on computer generated groundwater modeling, the arrangement of groundwater extraction wells in CMA-5 would result in portions of the contaminant plume having very low hydraulic gradients. These areas with low hydraulic gradients, or "dead zones", would greatly lengthen the time it would take to remediate those areas. Hence, CMA-5 would be less effective than CMA-3 and CMA-6, and it has therefore not been initially selected by EPA as EPA's preferred CMA.

CMA-6 (page 001223 of the Administrative Record)

CMA-6 has the same number of groundwater extraction wells as CMA-5, but the orientation (location) of the groundwater extraction wells in CMA-6 has been optimized to produce more favorable groundwater hydraulic conditions. In addition, water collected in the electrical man-hole, EM-4, will be removed for treatment. An illustration of the orientation of the groundwater extraction wells for CMA-6 is shown in Attachment 9. Computer generated groundwater modeling shows that CMA-6 is more effective in capturing the groundwater contaminant plume than CMA-2, CMA-3, CMA-4 and CMA-5. Hence, CMA-6 is EPA's preferred initial alternative.

Clean-up Goals/Points of Compliance

The contaminated soil is below health-based levels but are above natural background levels. Therefore, soils will be remediated by natural attenuation. Clean-up goals have been established in order to determine when groundwater remediation has been completed. For the Facility, clean-up goals have been established that are either Maximum Contaminant Levels (MCLs) or 10^{-6} cancer risk levels. MCLs are federally enforceable drinking water standards developed under the Safe Drinking Water Act, 42 U.S.C. §§ 300f - 300j -11, as amended and codified in 40 C.F.R. Part 141. The 10^{-6} cancer risk based level represents the concentration of a carcinogen such that a person of average weight drinking two liters/day of water containing that concentration of the contaminant would have no more than a one in one million chance of developing cancer from drinking the water during a 70-year life span.

When establishing clean-up goals, it is also necessary to identify the groundwater monitoring wells, and surface water locations at which the compliance with the goals will be measured. These points of compliance shall be: monitoring wells #10, #17, and #28; surface water stations #15, #21, and #67; and Henrico County Municipal Well #143-20.

The following table illustrates the clean-up goals for the four contaminants in groundwater and surface water.

Contaminant	Clean-up goal (in ppm)	Rationale
TCA	0.200	MCL
DCE	0.007	MCL
MEC	0.005	10^{-6} Cancer Risk
DCA	0.0004	10^{-6} Cancer Risk

EPA acknowledges that, due to the high concentrations of VOCs in the groundwater and the kinetics of chemical and physical desorption of contaminants in soil and groundwater, it may be technically impossible to attain the clean-up goals. It is quite possible that concentrations of VOCs in the groundwater may reach a level at which, regardless of the pumping and treatment that is undertaken and the length of time pumping and treatment is implemented, an equilibrium concentration of VOCs in the groundwater is attained. This equilibrium concentration may exceed the required clean-up goal. To account for this possibility, EPA has provided AT&T the opportunity to petition EPA to modify the clean-up goal as described below.

If after five (5) years of groundwater pumping and treatment, concentrations of TCA, DCE, MEC, and DCA in groundwater have remained constant, AT&T may petition EPA to revise the clean-up goals. In such a case, an acceptable clean-up goal may be a stable VOC concentration in which the change in VOC concentration over time is negligible. If a stable concentration of a VOC in groundwater is reached, a study will be conducted by AT&T to determine the effect that the remaining VOC's have on groundwater quality at the downgradient property boundary.

After every five (5) year period of groundwater pumping and treatment, EPA shall evaluate the effectiveness of this Corrective Measure. Based on EPA's evaluation, EPA may require AT&T to perform additional studies and/or to perform modifications to the existing Corrective Measure. In the event that EPA requires AT&T to perform additional studies and/or to perform modifications to the existing Corrective Measure, EPA will provide an opportunity for public comment prior to the initiation of change(s) to the existing Corrective Measure.

Health Risk and Length of Time Needed for Remediation of CMA-6

Due to the high VOC concentrations in the groundwater and the kinetics of desorption, it is very difficult to predict exactly when the clean-up goals will be achieved. However, based on computer generated groundwater modeling, AT&T predicts that CMA-6 would take between 23-25 years of continuous pumping and treatment of groundwater before the clean-up goals, as discussed above, can be achieved. Computer modeling predicts that surface water will attain clean-up goals within 6 months of the implementation of CMA-6.

EPA has determined that CMA-6 is protective of human health and the environment. Risk of the groundwater contaminant plume impacting human health and/or the environment will be greatly reduced by virtue of the capture zone created by CMA-6. Of the CMAs proposed by AT&T, as discussed above, CMA-6 is the most effective means of remediating groundwater at the Facility.

Actual or threatened releases of hazardous constituents from this Facility, if not addressed by the preferred Corrective Measures Alternative or another CMA may present a current or potential threat to human health and the environment.

Preferred Corrective Measure Alternative and EPA's Rationale for Preliminary Identification of this Corrective Measure

AT&T recommended CMA-6 or CMA-3 as its preferred CMA. Based on the decision criteria that are identified in more detail below, EPA has determined that CMA-6 will be protective of human health and the environment.

EPA prefers CMA-6 because it utilizes proven technologies and is protective of human health and the environment. EPA is also confident that this corrective measure can be effectively employed to remediate the groundwater contaminant plume, surface water and contaminated soil at the Richmond Works.

A more detailed evaluation of CMA-6 is provided below. The evaluation is based upon the following criteria: performance, reliability, implementability, health and safety, environmental, and cost.

1. Performance: The pump and treat system described in CMA-6 will utilize twelve (12) groundwater extraction wells. According to computer generated modeling, CMA-6 will create a groundwater capture zone of 157 acres, and, after achieving the clean-up goals, is expected to recover a total of 243.8 gallons of VOCs. Water that infiltrates through the soil through precipitation will also help remove VOCs that are trapped in the soil.

2. Reliability: The selected alternative of pump and treat with air stripping for VOC removal from groundwater is a proven technology. Its reliability has been demonstrated at numerous other facilities. Due to the relatively simple nature of the pump and treat system, non-operation durations resulting from system failures will be minimal.

3. Implementability: Hydrologic and operational conditions at the Facility are ideal for the use of a pump and treat system. The shallow nature of the surficial water bearing zone (approximately 20 feet thick) and the relative ease of drilling into the soil for well installation allows CMA-6 to be implemented quickly. In addition, the existence of an air stripper and carbon adsorption unit to treat the air emissions which were in use prior to AT&T's conversion to aqueous based processes, will drastically reduce the amount of construction for the treatment units.

4. Health and Safety: The removal of VOCs in groundwater, will also reduce the levels of VOCs in Gillie Creek and in the soil. By eliminating potential routes of exposure, human health and safety will be enhanced. To prevent cross-media contamination, the off-gases from the air-stripper will be passed through an activated carbon unit prior to release into the atmosphere. The emissions from the air stripper and the granulated activated carbon unit will meet the requirements of the Clean Air Act. In addition, a groundwater and surface water sampling program will be initiated to evaluate the effectiveness of CMA-6.

5. Environmental: Operation of the on-site pump and treat system will minimize the adverse impact of the VOC contamination on the environment. The overall level of contamination and the size of the contaminated areas will be significantly reduced. This reduction will serve as a benefit to current and future users of the groundwater resources within the immediate area.

6. Costs: The total estimated capital and annual operation and maintenance costs associated with CMA-6 will be $850,675 and $328,670, respectively.

Public Involvement/Procedural Requirements

EPA is requesting comments from the public on all Corrective Measure Alternatives and on EPA's preliminary selection of CMA-6 as the preferred Corrective Measure Alternative to remediate the on-site and off-site contamination from the Facility. The public comment period will last thirty (30) calendar days from the date that this matter is publicly noticed in a local newspaper. Comments on the Corrective Measures Study and/or EPA's preliminary identification of a preferred Corrective Measure Alternative should be in writing. Written comments may be

submitted to:

Kai Hon Shum
U.S. EPA, Region III
841 Chestnut Building
Philadelphia, PA 19107

Attn: 3HW64

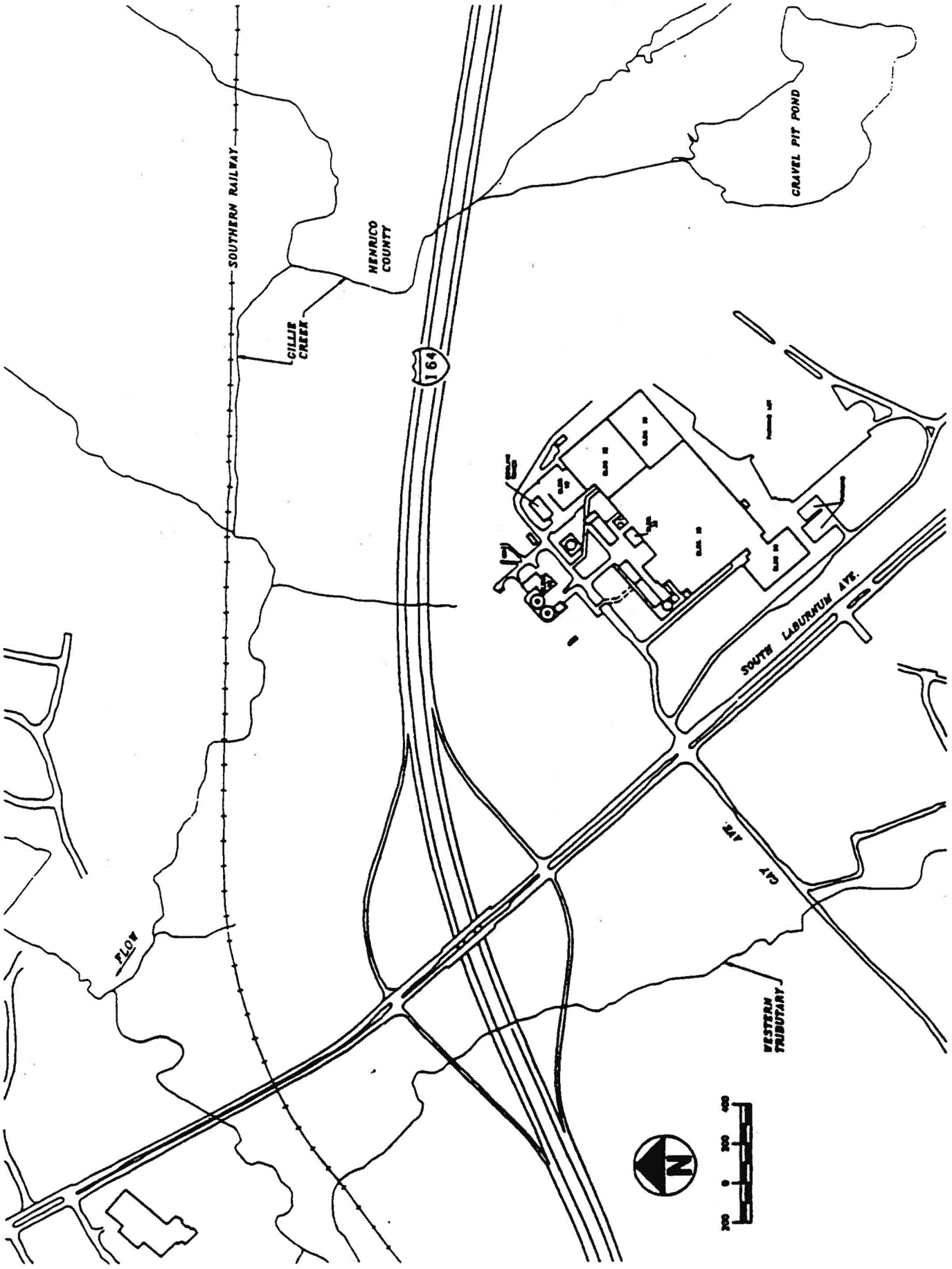
Additionally, EPA is also scheduling a public meeting to discuss this matter in more detail and to receive any oral comments from the public on June 26, 1991. Persons interested in such a meeting should contact Mr. Kai Hon Shum at (215) 597-0130 within the thirty (30) calendar day public comment period. EPA will notify the public of the time and location of the public meeting through a newspaper advertisement.

Following the thirty (30) calendar day public comment period and any public meeting, EPA will prepare a Response to Comments which addresses all substantive written comments and any substantive comments generated at the public meeting. The Response to Comments will be made available to the public. If the comments are such that significant changes are made in the Corrective Measure Alternative identified by EPA, EPA will seek public comments on the revised Corrective Measure Alternative.

Upon consideration of public comments and after the Response to Comments has been publicly noticed, EPA will approve a final Corrective Measure Alternative for the AT&T Richmond Works Facility. At that time, EPA and AT&T will begin negotiations on a RCRA Section 3008(h) Corrective Measure Implementation Administrative Consent Order requiring implementation of the EPA-approved final Corrective Measure Alternative.

5/10/91
DATE

THOMAS C. VOLTAGGIO, DIRECTOR
HAZARDOUS WASTE MANAGEMENT DIVISION



CDM *environmental engineers, scientists, planners & management consultants*	AT&T RICHMOND WORKS	Figure No.
	RICHMOND WORKS VICINITY MAP	I-1