

Region 3 GPRA Baseline RCRA Corrective Action Facility

IBM Manassas

9600 Godwin Drive
Manassas, VA 20110
Congressional District 10
EPA ID #: VAD064872575
Last Updated: December 22, 2005

Current Progress at the Site

A program has been implemented to remediate and monitor a plume of perchloroethylene (PCE) in the groundwater extending northeast from the facility in Manassas, Virginia three miles to a former public supply well in Prince William County. The remediation program includes groundwater pump and treat, groundwater monitoring, and soil vapor extraction.

The groundwater pump and treat portion of the remediation program was initiated in 1985 and currently consists of four pumping wells, and an additional pilot pumping well. Extracted groundwater is treated with two stage carbon adsorption systems. Spent carbon is recovered at an offsite facility. As of December 2004¹, the groundwater pump and treat system has removed a total of 1,165 gallons (15,696 pounds) of PCE from the groundwater. In 2004, PCE concentrations averaged 4373 ppb, 36.9 ppb, 644 ppb, 57.7 ppb and 9149 ppb, in well locations D-28, D-47, OF-34, and PW-07, and D-39, respectively. These values show reductions from a high concentration of approximately 9000 ppb (1992), 290 ppb (1990 - D-29 data), 4,250 ppb (1991) and 200 ppb (1990) in well locations D-28, D-47, OF-34, and PW-07, respectively.

The soil vapor extraction system was initially tested in 1988 and includes six extraction wells and ten air inlet wells located on either side of Building 101. The system removes PCE from the soil vadose zone around Building 101. As of December 2004, the vapor extraction system has removed a total of 1,651 gallons (22,280 pounds) of PCE from the environment. In 2004, 15.7 pounds of PCE were removed by the vapor extraction system, and average PCE concentrations in air samples removed from the soil vadose zone were 2.6 parts per million by volume. This value shows a reduction from an approximate concentration in 1990 of 1,800 ppmv.

Groundwater data from monitoring wells has been collected since the late 1980's. The monitoring includes analyses to confirm that the volatile organic compounds (VOCs) in the plume are being contained and that progress toward the cleanup goals is being achieved. The current monitoring program requires monthly groundwater level measurements from 82 monitoring wells, monthly analysis of VOC concentrations in groundwater from the five pumping wells (four monitoring wells and one former public water supply well), and quarterly or annual analyses of groundwater from 30 monitoring wells and five private water supply wells. Evaluation of groundwater level and groundwater quality data collected thus far demonstrates that the pumping wells have contained the VOC plume.

IBM continues to implement the full remediation program including groundwater pump and treat, soil vapor extraction system, and groundwater monitoring. In the last year, IBM has installed a deeper and larger diameter well by the Building 101 source area to replace the current extraction well D-28 and will begin operating the new well in 2006.

¹ Based on information presented in the Corrective Measure Implementation Program 2004 Annual Progress Report dated April 8, 2005.

IBM submitted three workplans in 1999, in response to EPA's request.

1. Vapor Extraction System Shutdown Investigation Workplan

This workplan was requested because IBM has observed diminished removal of PCE through the system and is considering eliminating the system. EPA requested, and IBM submitted a plan, to determine whether shut down of the vapor extraction system (VES) will impact groundwater contamination or air quality and whether continued mass removal by the VES is insignificant relative to IBM's ability to meet the remediation goals. EPA has reviewed IBM's workplan. EPA agrees that the residual contamination removed annually by the VES is much less than the initial quantities. EPA is concerned about residual contamination that may remain below Building 101 and that continued operation of the system may be beneficial. On December 20, 2005, IBM notified EPA that "At this point in time, we plan to continue operation of the vapor extraction system."

2. Groundwater Plume Characterization Workplan

While previously uncontaminated wells are routinely monitored to ensure that the contaminated groundwater plume is contained, IBM has not monitored the interior perimeter of the plume since 1992. EPA requested IBM to assess the plume size to complete a review of the remediation program. Since EPA made this request, and IBM submitted a Workplan, EPA has focused its resources on addressing sites with uncontrolled environmental indicators and has deferred this portion of IBM's assessment. IBM continues to assess groundwater contamination inside and outside of the plume, and assess groundwater flow to ensure contaminated groundwater flows towards the extraction area and not outside of the extraction area. EPA will evaluate whether the groundwater monitoring associated with the start-up of pumping from Well D-80 will address EPA's original request for groundwater plume characterization.

3. Corrective Measures Review Workplan

EPA requested this workplan because IBM determined that the current remedy is not substantially reducing the concentration of contaminants in the groundwater in the suspected source area, and also, Prince William County Service Authority discontinued pumping the principal well which has drawn the contaminant plume three miles from its source. Since EPA made this request, and IBM submitted a Workplan, EPA has focused its resources on addressing sites with uncontrolled environmental indicators and has deferred this portion of IBM's assessment. In addition, results from the 2002, 2003, and 2004 Annual Progress Reports appear to indicate contaminant reduction is now occurring at each of the compliance wells and most of the trend wells which may indicate that the current implemented "corrective measure has stabilized and is progressing toward its intended goal." In October 2004, IBM submitted a workplan to install a new large diameter and deeper extraction well by Building 101. EPA approved the workplan on October 19, 2004. In March 2005, IBM submitted a "Report of Findings Installation and Testing New Groundwater Extraction Well D-80". On June 14, 2005, based on a review of the report, EPA requested a workplan to incorporate the new well into the groundwater extraction system. IBM plans to submit the workplan in January 2006.

On November 17, 2005, in response to the interest of a prospective purchaser (Galaxy Investments) of 56.7 acres of unused land (Parcel D-2), IBM submitted a letter requesting EPA to determine that IBM has completed all corrective measures applicable to Parcel D-2. On December 15, 2005, EPA determined that corrective measures on Parcel D-2 are complete.

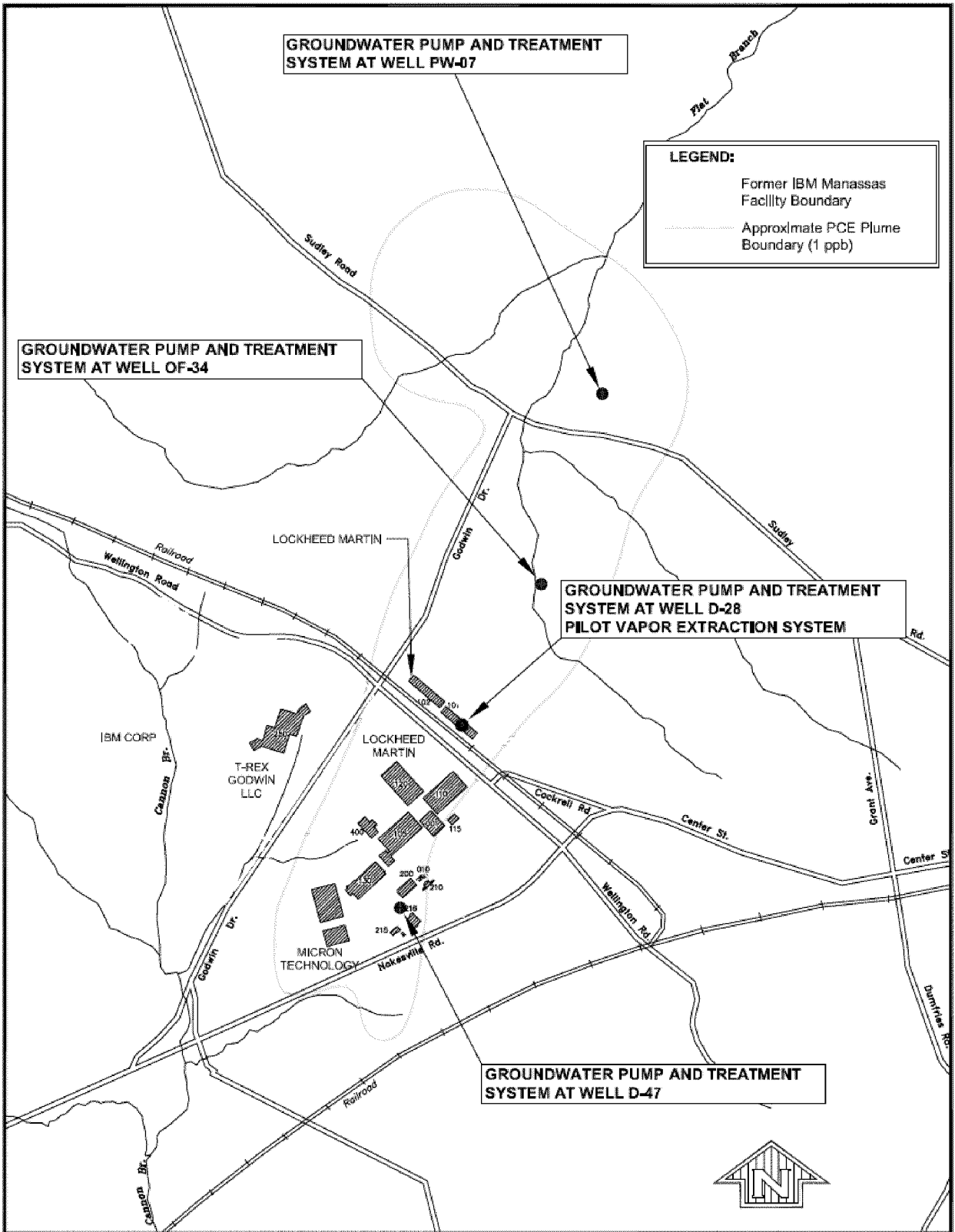
Site Description

In 1969, IBM began operating a 600-acre facility located in north central Virginia, approximately 25 miles southwest of Washington, D.C. The principal activities at the Facility were semiconductor design and the manufacturing and development of electronic defense systems. Although IBM continues to retain the responsibility for RCRA corrective measures implementation at the Manassas facility, the facility now contains portions owned and operated by other businesses, including the Lockheed Martin Corporation and Micron Technology, Inc.

Through investigations implemented by IBM from 1978 through the early-1980's, IBM identified the presence of elevated volatile organic compounds in onsite soils and groundwater. As a result of the initial investigations, IBM removed one 10,000-gallon waste solvent tank and two 20,000-gallon waste acid tanks, closed two underground tanks and associated appurtenances, removed 1227 tons of contaminated soil which were disposed in an EPA-approved hazardous waste landfill, treated soil to raise the pH in contaminated soils and immobilize fluoride, and installed 49 onsite wells and 45 offsite wells to monitor groundwater. Subsequently, IBM provided city (Manassas) water hookups to five (5) residences, assisted the Prince William County Service Authority in installing and monitoring a groundwater treatment system for its public supply well, implemented a groundwater pump and treat system, and implemented a pilot soil vapor extraction system.

On March 1, 1989, EPA and IBM entered into a Consent Order requiring IBM to complete its onsite and offsite investigation of the nature and extent of the contamination and conduct a study to evaluate various cleanup alternatives. The requirements of the order were satisfied with EPA's approval of the CMS Report on March 8, 1990. The final remedy selected by EPA on July 25, 1990 provided for the addition of one offsite pumping well to the existing groundwater pump and treat system and continued the pilot soil vapor extraction system. On February 11, 1991, EPA and IBM entered into a second Consent Order requiring IBM to implement the selected remedy. As a result of local approval requirements, the offsite pumping well did not begin operating until August 1997.

A figure of the facility and the contaminant plume is presented below:



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IBM CORPORATION
 9600 Godwin Road
 Manassas, Virginia 20101

DATE: JUNE 2004
 0 1000 2000
 SCALE IN FEET

LOCATION OF CORRECTIVE MEASURES FORMER IBM MANASSAS FACILITY

Site Responsibility

RCRA Corrective Action activities at this facility are being conducted under the direction of EPA Region 3 with assistance from the State.

Contaminants

Cleanup goals were established for the pumping wells based on Maximum Contaminant Levels (MCLs) and 10^{-6} cancer risk-based levels. MCLs are federally enforceable drinking water standards developed under the Safe Drinking Water Act which are published at 40 C.F.R. Part 141, Subpart B. The 10^{-6} cancer risk-based level represents the concentration of a carcinogen such that a person of average weight drinking two (2) liters/day of water containing 0.67 micrograms/liter of the contaminant would have no more than a one (1) in one (1) a million chance of developing cancer from drinking the water during a 70-year life span. EPA acknowledges that it may be technically impossible to achieve these cleanup goals and has provided in the Consent Order that IBM may petition for alternative goals in the future (as long as drinking water continues to be treated to levels no less stringent than an MCL).

The principal contaminants in soil and/or groundwater associated with releases from IBM's operation of the plant and breakdown products from the releases are perchloroethylene (PCE), trichloroethylene (TCE), and 1,2-trans dichloroethylene (trans 1,2-DCE). The compound 1,1,1-trichloroethane (1,1,1 TCA) is also in onsite and offsite groundwater and possibly originated from an offsite source. These chemicals are all in a class of chemicals called "volatile organic compounds" or VOCs.

The MCL identified in the final remedy is 5 ppb for PCE, 5 ppb for TCE, 70 ppb for trans 1,2-DCE, and 200 ppb for 1,1,1 TCA. The 10^{-6} cancer risk-based level in drinking water that is identified in the final remedy is 0.67 parts per billion (ppb) for PCE and 3 ppb for TCE. The compounds trans 1,2-DCE and 1,1,1 TCA are toxic to the body but do not induce cancer.

Community Interaction

EPA solicited public comments on the preliminary identification of the final selected remedy for 30 or more days during March and April of 1990. Two comments were received. IBM opposed the requirement to meet a cleanup goal for 1,1,1 TCA because it is not believed that IBM is the source of the 1,1,1 TCA in the groundwater. EPA retained the cleanup goal for 1,1,1 TCA because IBM's recovery wells had caused the compound to migrate onto IBM's property. A citizen concerned with property values, environmental effects, and public safety opposed the selected location for the additional offsite well. IBM resolved this issue by working with the residents to design and develop a housing for the well pump and treatment system which met their approval.

Institutional Controls

IBM monitors groundwater quality extensively throughout the plume and monitors groundwater levels throughout and beyond the plume, including five (5) private water supply wells that are located upgradient of the plume. In September 2002, the Prince William County Service Authority discontinued the use of all public water supply wells north of the former Manassas facility and began

providing water from other regional water companies. Both the Prince William County and the City of Manassas prohibit the installation of water wells for potable use. In addition, IBM maintains a community relations plan and coordinates activities with the City of Manassas, Prince William Health District, and Prince William County Service Authority.

Government Contacts

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For more information about EPA's correction action webpage, including Environmental Indicators, please visit our site at: www.epa.gov/reg3wcmd/correctiveaction.htm

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