

**AMT, Inc. Facility**  
Derekwood, USA

**Initial Site Data  
for Corrective Action Workshop  
Case Study**

**REPORT # 1**

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## **Background of AMT, Inc. Facility for Corrective Action Workshop (excerpted from RCRA Facility Assessment)**

### **Facility Size and Location**

AMT, Inc. is a 17-acre operating facility (located in Derekwood, USA). The facility has been in operation since 1967. The facility is bounded (see Base Map Figure 1 and Site Photo Figure 2) by Middlesex Avenue to the west, residential properties and a nursing home (under construction) to the north, residential properties along River View Drive to the south, and a railroad right-of-way, 80-slip marina, and additional residences to the east.

### **Facility History**

AMT, Inc. is a high volume manufacturer of knitting needles, crochet hooks and other related items. The production of knitting needles and related items requires the use of various metal finishing processes, particularly nickel plating and anodizing. Prior to 1973 the wastewater from these generators were discharged directly to the Crystal River. Between 1973 and 1988, approximately 18 cubic yards of metal hydroxide sludge (F006 listed hazardous waste) generated from the waste water treatment plants was discharged to two onsite seepage lagoons (labeled “former waste lagoon” on map). These former waste lagoons are regulated solid waste management units. The rinse waters and other wastewater resulting from these metal finishing operations are processed in an onsite treatment plant that has been in operation since 1973. The treated wastewater is discharged to the Crystal River in accordance with an existing NPDES Permit. The sludge contained nickel, aluminum hydroxide, minor concentrations of lead, chromium, and barium. After January of 1988, disposal in the lagoons ceased and the sludge has been removed from the facility and disposed of offsite at regulated disposal facilities. The lagoons underwent “closure” from September of 1988 through August 8, 1990, at which time they were officially recognized as properly closed. Closure consisted of removing sludges and 2-3 feet of underlying contaminated soils, placing clean fill to grade and installing a semi-impermeable cap over residual contamination left in place. Monitoring of wells 1-4 is ongoing through a post-closure permit. The only suspected source of organic contamination at the facility was from the use of an automatic liquid immersion degreaser 1,1,1-trichloroethane (TCA). Solvent used in the degreaser was stored in an above ground storage tank which has since been removed in 1989. There is no evidence that there were other waste management units on site.

The facility is currently undergoing investigation and remediation in accordance with a State cleanup program that is being used to satisfy RCRA Corrective Action requirements. While this State program has not yet received authorization for RCRA Corrective Action, the EPA Region is generally comfortable with the State program. Additionally, the Region is providing site-specific oversight to ensure that the results achieved by the State program will meet the goals of the RCRA Corrective Action program. Note: A “snapshot” of the initial Corrective Action discussions between AMT, Inc. and the overseeing regulator is attached to this background description.

## **Key Features**

The physical setting surrounding the AMT, Inc. property is dominated by the Crystal River, about 1,300 feet east of the site, and by gently rolling and glaciated topography typical of the eastern highlands and physiographic province of Derrekwood. Elevations in the vicinity of the AMT, Inc. site range from a low of approximately 5 feet above mean sea level at the Crystal River to just over 100 feet on the crest of a drumlin located north-northwest of the property. Much of the area is overlain by unconsolidated deposits, generally 75 feet or less in thickness. Much of the westerly margin of the Crystal River near the site consists of low-lying swamp wetlands, which are part of the Crystal River floodplain. The 100 year flood boundary lies about 100 feet east of the eastern-most property boundary and 200 feet east of the former lagoons. There are no streams or mapped wetlands on the property. However, across the railroad tracks is an area of wooded wetlands which extends to the Crystal River. The wind rose shows the prevailing wind to be from the southwest from April through August and from west-northwest to north through the remaining months of the year.

The uppermost ground water in the area consists of water-table aquifers, with the direction of ground-water flow generally reflecting the influence of local topography. Areas of ground-water discharge are, therefore, directed toward small tributary streams, wetlands, and the Crystal River. Shallow aquifers dominate the areas and characteristically result in wells of low yield; 1 to 3 gallons per minute (gpm). However, in those areas adjacent to the Crystal River which are composed of stratified glacial drift (i.e., kame terraces) and associated alluvial deposits, well yields can range from 200 to 2,000 gpm. Because bedrock in this area consists of crystalline metamorphic rocks having essentially no primary porosity, bedrock well yields are typically low (1 to 5 gpm).

The geology and the hydrogeology of the AMT, Inc. property have been determined from published data and from the drilling of 5 monitor wells at the site associated with the former waste lagoon. The monitor well network consists of three shallow overburden wells (MW 1,4,5) and two deeper overburden well pairs MW(2A,B, and 3A,B) (See Table 1). A geologic cross section for the site has been prepared using elevations of bedrock and grade in the monitor wells and descriptions of the unconsolidated sediments and bedrock examined during drilling (See Figure 3).

There are two aquifers beneath the AMT, Inc. property - an upper water-table aquifer in the unconsolidated sediments (till) and a bedrock aquifer in the fractured gneiss/schist bedrock. Depths to the water table lie at about 8 ½ feet below ground near the center of the property and about 15 feet below ground near the eastern and western perimeters of the property. Measurements of water levels in the two overburden/shallow bedrock well pair indicate a generally upward vertical gradient exists at the eastern portion of the site. Water-level data show that the overburden and bedrock aquifers are hydraulically connected over much of the property. Ground water in the vicinity of the site is designated as suitable for drinking without treatment. The direction of ground-water flow across the eastern half of the site is in an east-northeasterly direction. Average ground-water flow velocity is .35ft/day.

The residences near the facility obtain their drinking water from private potable wells completed in the bedrock aquifer. The depth of the Smith well located east of the facility is approximately

500 feet. The depths of the remaining potable wells located adjacent to the facility range from 150 to 200 feet. Potable wells in this area typically are cased with steel 50 feet into the bedrock.

### **Contaminant Occurrence**

Post-closure monitoring was conducted for several years. Chromium VI and Barium have been detected above MCLs in monitoring wells 2A and 3A. In addition low concentrations of 1,1,1, Trichloroethane (TCA) began to be unexpectedly found in monitoring well 1A, which is upgradient from the lagoon, and monitoring wells 2A and 2B. Reported concentrations of TCA in these wells were well below the 200 ppb groundwater protection standard. Because the waste lagoon was not suspected to be the source of the TCA contamination, monitoring well 5A was installed in 1992, downgradient of a suspected source of TCA, the former aboveground storage tank. TCA was found in the groundwater collected at well 5A at 1,900 ppb.

In addition, an interview with a past employee indicated that sludge from the waste lagoon was at least at one time stored in a pile on site near the manufacturing building before being disposed of in the waste lagoon, and he believed that it was never fully removed.

Additionally, two recent rounds of sampling from the Smith potable well (one conducted by the Health Dept. and the other by AMT, Inc.) did not reveal any contamination above levels of concern. The facility has conducted quarterly monitoring since the detection of TCA in well 5A. See attached letter from Mr. and Mrs. Smith sent to Ms. Simpson of AMT, Inc.

## **Snapshot of Initial Communication between AMT, Inc. and Overseeing Regulator**

The first meeting between AMT, Inc. and the overseeing regulator occurred with two representatives from each organization in June 1998. The meeting was initiated by the regulator to help educate the facility about requirements for a RCRA Facility Investigation, Corrective Measures Study, Remedy Selection and Corrective Measures Implementation. The meeting started congenial, yet somewhat superficial as this was the first time any of these people had met. However, as the regulator proceeded to outline the important components of the Corrective Action process, representatives of AMT, who were congenial at first, appeared frustrated, and, at one point, almost intolerant.

At one point, AMT stated to the overseeing regulator, “I don’t have the faintest idea how we can work through such an unclear, winding maze of requirements. One of my colleagues said that at his company, they have spent far more than they anticipated on consultants and lawyers. Furthermore, in the five years of conducting Corrective Action, the only contamination they’ve cleaned up is in the hundreds of soil and groundwater samples they’ve sent off-site for chemical analysis. They feel that they’ve been ready to implement a common-sense remedy, but they’ve been told that they can’t proceed until they have finished delineating the “nature and extent” of contamination. I realize I have to conduct some additional investigations and may even have to cleanup some contamination, but I don’t want to waste a lot of money or time following some rigid process.”

In response to AMT’s concerns, the regulator emphasized that these steps and procedures were necessary to meet Federal Corrective Action requirements, and guidelines. The regulator ensured the AMT representative that they would work with the facility to streamline the process wherever possible.

The meeting ended with frustration. AMT left believing that the regulator was inflexible and that he would likely have to get the lawyers involved. The regulator left believing that AMT was likely to be recalcitrant.

May 11, 1998

Dear Ms. Simpson  
AMT Inc.  
Derekwood, USA

I am writing because of the great concern my wife and I have regarding the chemical contamination from your company. Six months ago we heard through the grapevine that your company knows of chemicals in the ground from your operations, and that these chemicals are in the groundwater. We live in a home just next to your company borders. My wife and I worked for thirty-five years in Chicago, and two years ago we used out savings to move to Derekwood and bought a retirement home. We liked it here, until we heard about these chemicals. Our two sons from New York and their families visit us each summer, and this year our two granddaughters will stay for two weeks after the 4<sup>th</sup> of July. We don't know if it is safe for us to be in this house or even if it is safe for our grandchildren to visit or to play on the grass outside our house. We are also fearful for our property value.

On our ranchette, we use a drinking water well. When we heard about these chemicals in the ground, we immediately called the local Health Department. They came out and sampled our well. But I understand the chemicals they sampled for are not the chemicals put by your company into the ground. My son, who graduated two years back from (college near Chicago) as a chemist, tells me these chemicals in the ground can make an invisible vapor that can come up through our basement into the house and cause us to be sick and maybe even get cancer if we are around it long enough.

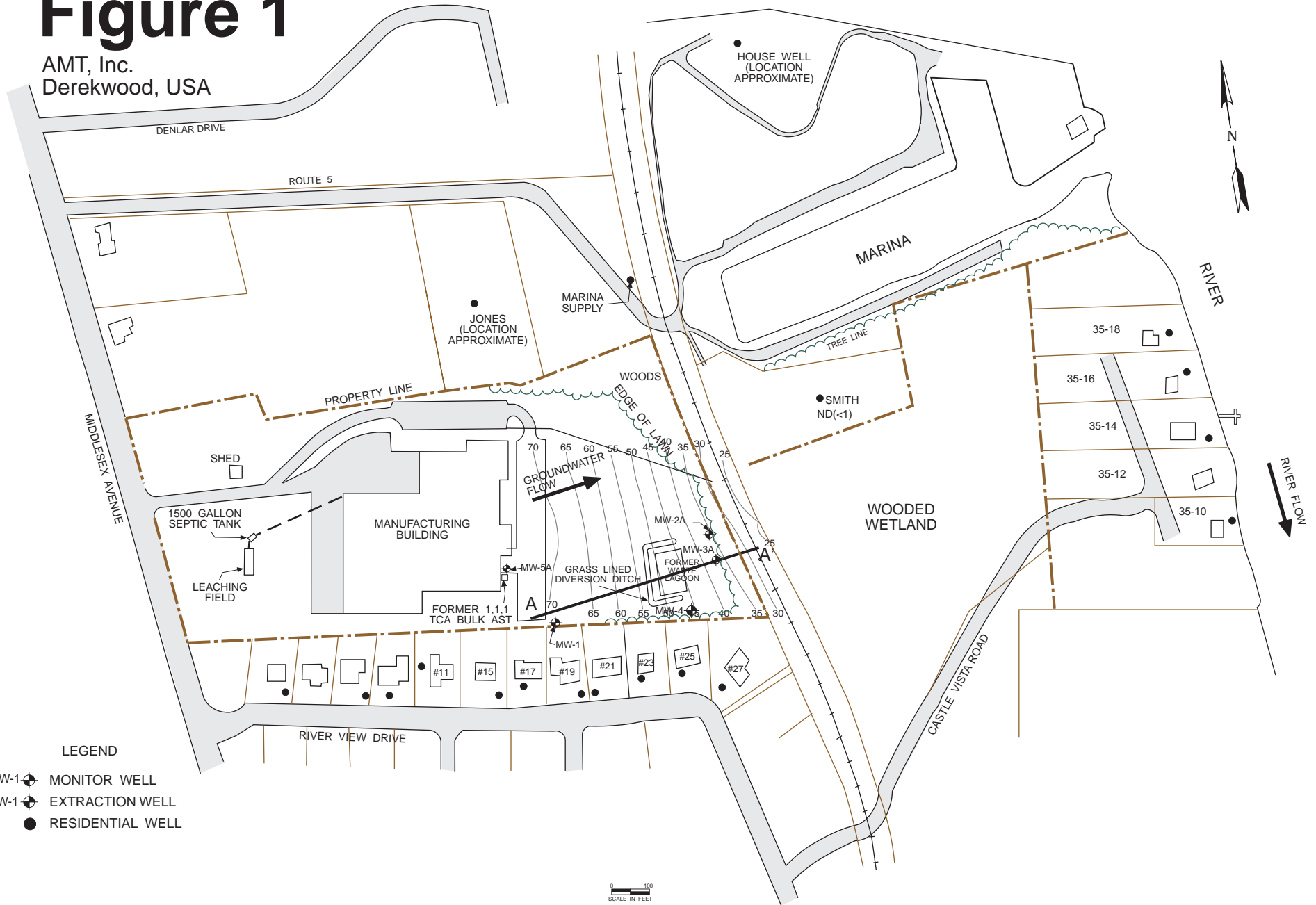
Two people, a nice man and a lady, who I understand your company hired from the university, came out and sampled our well about six weeks ago. They sent us the results last week. I am not a scientist, so these numbers don't mean much to me. The university tells us the chemicals from your company in the ground are not found in my well right now. Something still doesn't seem right!

We are very worried that we may be in danger, and we wonder if we should tell our sons not to bring our granddaughters for the 4<sup>th</sup> of July. And what about our property values? What will happen to our investment? We want you to tell us what you going to do about it.

Waiting your reply,  
Mr. And Mrs. Bill Smith

# Figure 1

AMT, Inc.  
Derekwood, USA



## LEGEND

- MW-1 MONITOR WELL
- EW-1 EXTRACTION WELL
- RESIDENTIAL WELL

0 100  
SCALE IN FEET

# Figure 2

AMT, Inc.  
Derekwood, USA





**Table 1: AMT, Inc.  
Initial Site Characterization Data as of June 1998 Regulator Meeting  
(Reported in ug/l)**

| <b>Well/Location <sup>1,2</sup><br/>(State/Federal Standard)</b> | <b>TCA <sup>3</sup><br/>(200 ug/l)</b> | <b>Chromium VI <sup>4</sup><br/>(100 ug/l)</b> | <b>Barium <sup>5</sup><br/>(1,000 ug/l)</b> | <b>Nickel <sup>6</sup><br/>(100 ug/l)</b> | <b>Lead <sup>7</sup><br/>(15 ug/l)</b> |
|--|--|--|---|---|--|
| MW-1A  | 25                                     | ND(<5)   | ND(<1)                                      | ND(<20)                                   | ND(<30)                                |
| MW-2A  | 43                                     | 125  | 3,000                                       | ND(<20)                                   | ND(<30)                                |
| MW-2B  | 6                                      | ND(<5)   | ND(<1)                                      | ND(<20)                                   | ND(<30)                                |
| MW-3A  | ND (<1)                                | 320  | 5,000                                       | ND(<20)                                   | ND(<30)                                |
| MW-3B  | ND (<1)                                | ND(<5)   | ND(<1)                                      | ND(<20)                                   | ND(<30)                                |
| MW-4A  | ND (<1)                                | ND(<5)   | ND(<1)                                      | ND(<20)                                   | ND(<30)                                |
| MW-5A  | 1,900                                  | NA   | NA  | NA  | NA                                     |
| Smith Residential Well <sup>8</sup>                              | ND (<1)                                | ND(<5)   | ND(<1)                                      | ND(<20)                                   | ND(<30)                                |

Footnotes:

1. Data from Monitoring Wells 1-4A reflect results at the time of lagoon closure. MW-5A was installed and sampled in response to finding TCA in wells 1A and 2A.
  2. Locations: A = Shallow Overburden; B = Deep Overburden
  3. State Department of Environmental Protection Drinking Water Well Ground-water Protection Criteria for 1,1,1-Trichloroethane (TCA) = 200 ug/l
  4. Federal Clean Water Act MCL for Chromium = 100 ppb
  5. Federal Clean Water Act MCL for Barium = 2,000 ppb; Connecticut Department of Environmental Protection Drinking Water Well Ground-water Protection Criteria = 1,000 ug/l
  6. State Department of Environmental Protection Drinking Water Well Ground-water Protection Criteria for Nickel = 100 ug/l
  7. State Department of Environmental Protection Drinking Water Well Ground-water Protection Criteria for Lead = 15 ug/l
  8. Data from the Smith well is based on a sampling event by the Health Department and on sampling by the owner/operator. Smith well depth is 565 feet. Well is cased 50 feet into bedrock and the pump intake is set 50 feet above the bottom of the well.
- ND = Not Detected (MDLs)  
NA = Not Analyzed

# Figure 3

AMT, Inc.  
Derekwood, USA

