RCRA FACILITY ASSESSMENT REPORT

Waters Corporation
MAD 001 047 968

34 Maple Street
Milford, Massachusetts

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
U.S. Environmental Protection Agency
Region I - New England
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Boston, MA 02114-2023

Task Order No.: R01012
Contract No.: EP-W-07-051

August 15, 2011

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August 15, 2011

Ms. Rosanne Sawaya-O'Brien, RTOCOR
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Subject: EPA Contract No. EP-W-07-051, Task Order R01012
RCRA Facility Assessment Report, Waters Corporation, Milford, MA
M&A Project No.: 7051012.001

Dear Ms. Sawaya-O'Brien:

Enclosed is one copy of the revised RCRA Facility Assessment for the Waters facility in Milford, MA. This RCRA Facility Assessment incorporates comments provided by EPA and by Waters Corporation personnel on a draft of this document issued by M&A previously.

If you have any questions or need additional copies, do not hesitate to contact me.

Very truly yours,

MABBETT & ASSOCIATES, INC.

BY:

James R. Greacen, LSP
Director, Site Assessment and Restoration

/tw

Enclosure: *RCRA Facility Investigation – Waters Corporation, Milford, MA* (1 copy) and 1 CD

cc: Robert Brackett, EPA
PDS, (MF-S)

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1.0 EXECUTIVE SUMMARY

The first step in the Resource Conservation and Recovery Act (RCRA) corrective action process is the RCRA Facility Assessment (RFA). The RFA is conducted to assess if a release of hazardous waste or hazardous constituents has occurred from solid waste management units (SWMUs) and to identify potential area of concern (AOCs) at the facility. The main components of an RFA are to identify and gather information on releases at the RCRA facility; to evaluate SWMUs for releases to all media (groundwater, surface water, air, and soil); and to make preliminary determinations regarding releases of concern and the need for further action and interim measures at the facility.

An RFA is currently being conducted for the Waters Corporation (Waters) facility located in Milford, Massachusetts. A file search of U.S. Environmental Protection Agency (EPA) Region 1 and Massachusetts Department of Environment Protection (MassDEP) file material for the site was conducted in August and September, 2008. Following completion of the file search, a preliminary review (PR) of the file material was conducted to develop an understanding of the site prior to conducting the visual site inspection (VSI). A VSI of the Waters facility was conducted on November 12, 2008, to address information gaps identified during the PR and to identify and document information associated with all SWMUs identified in the PR. Each SWMU identified during the PR was inspected and a meeting with facility representatives was conducted to obtain additional information. This report outlines the findings of the PR and the VSI.

The Waters facility is an active facility for storage, manufacturing, and research and development in High Performance Liquid Chromatography (HPLC) instrumentation, application, and supplies located at 34 Maple Street, Milford, Massachusetts. The geographical location of the facility is 42.137 latitude and -71.482 longitude. The location of the facility is shown on Figure 1. The facility is located in the midst of an industrial area surrounded by undeveloped, wooded land. The Waters facility is bounded on the north and the south by vacant, wooded land. The facility is bounded to the east by the right of way for Interstate-495, and an office complex / industrial facility to the west. According to the Town of Milford Tax Assessor's map, the Facility is listed as parcel number 45-0-1. The facility occupies over 45 acres, located in an area zoned for industrial use. The facility building occupies approximately 708,000 square feet of the property, and is used for a combination of warehouse, manufacturing, office, and laboratory space.

Waters Corporation began manufacturing in 1958 in Framingham, Massachusetts. They operated until 1973, when they moved to a new facility constructed for their use in Milford, Massachusetts. In 1980, the company merged with Millipore, and was renamed the Waters Chromatograph Division. The company remained under Millipore ownership until 1993, when Waters returned to independent ownership (Ref. WA47).

Prior to the construction of the on-site building in the early 1970s, available information indicates that the facility and surrounding areas were open forested wetlands. Waters began construction of the Milford facility in 1970, and moved their operations to the new facility in 1973. Additions to the original facility were constructed in 1974, 1978, 1986, and most recently in 2000. In 2004, Waters acquired the facility to the south of the main building located at 5 Technology Drive.

Manufacturing processes for HPLC machines has remained relatively unchanged over the past 30 years, with minor changes and variations in the chemicals used and wastes generated. Metal pieces of equipment are machined on-site to form parts for the HPLC equipment, and completed machines are assembled from additional parts fabricated at other facilities or purchased from distributors. Besides metals machining and assembly, the major activities performed on-Site are research and development, quality testing, and demonstration / instruction of assembled machines.

Based on the PR and information gathered during the VSI, a total of six SWMUs and four AOCs were identified at the Waters facility. The names of these SWMUs and AOCs are listed in Attachment 1 and their locations are identified on Figures 2, 3, and 4. In addition, an overview description of the SWMUs and AOCs is provided in Tables 1 and 2 and a more detailed discussion is provided in Section 6.0.

Table 1 - Solid Waste Management Units

SWMU #	SWMU Name	Type of Unit	Period of Operation	Waste Managed	Recommendation
1	Loading Dock Area	a. Drum Storage Area b. Roll off containers	1973 to present	Waste caustic, oily debris, waste acids	No Further Action
2	Solvent Storage Room	Drum Storage Area	1973 to present	Waste oil, waste solvent	No Further Action
3	Waste Storage Room (5 Technology Dr.)	Flammable Can Storage Area	2008 to present	Waste solvent	No Further Action
4	Wastewater Pretreatment System	a. Membrane Filtration b. Neutralization c. Batch Evaporation	1994 to present	Waste water	No Further Action
5A, 5B, 5C, 5D	Former Waste USTs	3 x USTs, removed from site and floor drains	1970s (varies) to 1985	Waste solvents and organics, liquid	Confirmatory Sampling
6	Domestic Waste	Trash Compactor (including 1996 hydraulic oil release)	1973 to present	Solid, domestic waste	No Further Action

Table 2 - Areas of Concern

AOC #	AOC Name	Type of Unit	Period of Operation	Waste Managed	Release Potential
1	Heating Oil USTs	2 x UST	1990s to present	No wastes managed, storing No. 2 Fuel Oil	Confirmatory Sampling
2A, 2B, 2C	Emergency Generator UST/ASTs	2 x UST 1 x AST	1980s to present	No wastes managed, storing No. 2 Fuel Oil	Confirmatory Sampling
3A, 3B, 3C	Former USTs	3 x USTs, removed from site	1970s (varies) to 1985	No wastes managed, stored acetone and toluene	Confirmatory Sampling
4	Roof Vents	Multiple vents	1970s to present	Air used in manufacturing	Confirmatory Sampling

2.0 INTRODUCTION

The 1984 Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) provide authority in the RCRA program to assist the U.S. Environmental Protection Agency (EPA) in implementing corrective action at RCRA facilities. RCRA facilities include all facilities that currently treat, store, or dispose of hazardous waste (or have done so in the past) as regulated under RCRA. The first step in the RCRA corrective action process is the RCRA Facility Assessment (RFA). The RFA is conducted to assess if a release of hazardous waste or hazardous constituents has occurred from solid waste management units (SWMUs) and to identify potential area of concern (AOCs) at the facility. A SWMU is defined as any discernable waste management unit at a RCRA facility from which hazardous constituents might migrate, irrespective of whether the unit was intended for management of solid and/or hazardous waste. An AOC is an area where evidence of spills or other releases of waste have occurred resulting from waste management activities that may not fit the definition of a SWMU release. The main components of an RFA are to identify and gather information on releases at the RCRA facility; to evaluate SWMUs for releases to all media (groundwater, surface water, air, and soil); and to make preliminary determinations regarding releases of concern and the need for further action and interim measures at the facility.

Under Work Assignment No. R01012, EPA Region 1 requested that Mabbett & Associates, Inc. (M&A) conduct a RCRA Facility Assessment (RFA) at the Waters Corporation (Waters, the facility) located on Maple Street in Milford, Massachusetts. This RFA report outlines the findings of the preliminary review (PR) and the visual site inspection (VSI). The purpose of the RFA was to identify, gather information on, and evaluate the potential for releases to the environment from AOCs, including SWMUs, where releases of hazardous constituents may have occurred in the past.

The specific objectives of the RFA are to:

- Perform a PR of the file material and conduct a VSI to assess the potential for release of hazardous wastes or hazardous constituents from each SWMU and AOC

- Identify all SWMUs and AOCs located at the Waters facility in Milford, Massachusetts

- Make preliminary determinations regarding releases of concern and the need for further actions, including confirmatory sampling (CS), RCRA facility investigations (RFIs) and/or interim measures (IMs) for each SWMU at the facility

2.1 File Search and Visual Site Inspection

A file search of EPA Region 1 and Massachusetts Department of Environment Protection (MassDEP) file material for the site was conducted in August and September 2008. Following the completion of the file search, a PR of the file material was conducted in September and October 2008 to develop an understanding of the site prior to conducting the VSI. A list of references used to prepare this report is provided in Section 7.0.

Primarily, the PR focused on past and current facility waste management practices involving waste generation, treatment, and storage and/or disposal. The PR also included a review of other activities and areas, not involving waste, which may have exhibited a potential for releasing contaminants to the environment (e.g., drum, raw materials, or product storage areas, fuel storage or transfer areas; and other areas of contamination). As a result of the PR, a tentative list of SWMUs was identified and used to plan the VSI. The PR also identified additional information that needed to be gathered during the VSI to fully assess the potential for releases from SWMUs.

On November 12, 2008, a five-person EPA/contractor team (Hammad Graham and Bob Brackett, EPA Region 1, James Greacen and Kiran Sears, Mabbett and Associates, Inc., and Amy Brezin, Booz Allen Hamilton) performed the VSI. The primary facility participants were Roger Eydenberg, Anita Taylor, and Bill Stares for Waters. The purpose of the VSI was to address information gaps identified during the PR and to identify and document information associated with all SWMUs identified in the PR. Each SWMU identified during the PR was inspected and a meeting with facility representatives was conducted to obtain additional information.

3.0 FACILITY DESCRIPTION

The EPA ID Number for the facility is MAD 001 047 968. The Waters facility is an active High Performance Liquid Chromatography (HPLC) manufacturing facility located at 34 Maple Street, Milford, Massachusetts, in Worcester County. The geographical location of the facility is 42.137 latitude and -71.482 longitude. The location of the facility is shown on Figure 1. The facility is located in the midst of an industrial area surrounded by undeveloped, wooded land. The Waters facility occupies over 45 acres, located in an area zoned for industrial use. The Facility buildings occupy approximately 708,000 square feet of the property, and the buildings are used for a combination of warehouse, manufacturing, office, and laboratory space. The facilities have always been connected to municipal services: including water and sanitary sewer (Ref. WA03).

A detailed plan showing the Waters facility layout is provided as Figures 2 and 3. An aerial overview showing the facility, surroundings, property borders, building locations, green and paved areas, the storm water system, and other details is provided as Figure 4. The facility consists of four interconnected buildings. The original building at 34 Maple Street has been augmented by a number of additions. Additionally, in 2004, Waters purchased the southern adjacent property, originally listed as 5 Technology Drive, which consists of 19.14 acres of land

occupied by three buildings totaling approximately 252,000 square feet. This 19.14 acre parcel is now included in the 45 acre Waters property. These buildings (labeled as buildings A, B, and C in Figures 2 and 3) were originally constructed in 1986. The buildings were occupied by EMC, a computer assembly and software development company prior to their purchase by Waters and were used primarily as office and server space since their initial construction (Ref. WA39).

The facility at 34 Maple Street houses the main fabrication and assembly areas, as well as various R&D laboratories and office areas. The facility at 5 Technology Drive houses smaller QA laboratories, additional office space, and the IT department. A section of this facility is currently vacant and gutted, undergoing complete renovation for similar use.

4.0 DESCRIPTION OF SITE ACTIVITIES AND HISTORY

Waters Corporation began construction of the facility in Milford, Massachusetts in 1970. Prior to the construction of the facility, the property was reported to be undeveloped, forested land. Waters began operating at the site in 1973 (Ref. WA05).

Since the facility opened, Waters has been a manufacturer of analytical equipment and separations technologies, specifically, the development and manufacture of High Performance Liquid Chromatography (HPLC) instrumentation, application, and supplies. The facility in Milford is a combination of office, manufacturing, warehouse, and laboratory space.

While the original facility was constructed beginning in 1970, with operations commencing in 1973, a number of additions to the main building have taken place since then, with construction performed in 1974, 1978, 1986, and the most recent occurring in August 2000. In 2004, Waters acquired the facility to the south of the main building, located at 5 Technology Drive. This acquisition consisted of three buildings (labeled as A, B, and C in Figures 2 and 3) (Ref. WA42).

The company employs approximately 5,000 people total, with offices and manufacturing facilities located across the world. The Milford, Massachusetts location is the world headquarters. While many of the larger scale manufacturing processes have been moved off-site, the machining and other on-site manufacturing processes have remained relatively unchanged over the past 30 years, with minor changes and variations in the chemicals used and wastes generated.

Metal pieces of equipment are machined on-site to form parts for the HPLC equipment, and completed machines are assembled from additional parts fabricated at other facilities or purchased from distributors. Besides metals machining and assembly, the major activities performed on-Site are research and development, quality testing, and demonstration / instruction of assembled machines.

4.1 Waste Management Practices

The Waters facility manufactures high pressure liquid chromatography (HPLC) instruments and other analytical equipment. A number of wastes are generated during these processes, which are described in detail, below (Ref. WA38).

Machining
Stainless steel and aluminum are used onsite for the fabrication of parts for the HPLC machines. The bars of metal are machined down into useable parts, creating a number of waste streams.

- Air ducts are connected to each machine to collect smoke and oil vapor created in the machining process. The oil is allowed to drain back down into the machine, and the air is off-gassed through stacks in the roof of the facility.
- A number of hazardous wastes are generated through the machining process. These wastes include: waste oil, waste oily water, and used oil absorbent pads.
- Water from the aqueous baths used to clean machined parts are reused for as long as possible, before being sent to the wastewater treatment plant.
- Scrap aluminum and stainless steel are collected at the end of each machining operation in a hopper, where the cutting oils are allowed to drain into drip pans. The oil is either returned to the machining operation, or if they contain too many metal fines, they are stored in a waste oil drum.

All collected wastes are stored in satellite accumulation areas for transportation to the loading dock and adjacent solvent storage room, before being transported offsite by a licensed waste hauler.

Passivation
Completed metal parts are put through cleaning processes and then dried. After the parts are electro-polished, they are sent into the passivation line where they are dipped into acid solutions (nitric and phosphoric) and then washed with deionized (DI) water. The vapor from the acid baths are collected in a scrubber, and a negative pressure is maintained in the room so that vapors will not permeate into the manufacturing floor, but instead will go out through either the scrubber, or the ventilation system, and out of the building. Wastes from this area include acids, when the baths are changed, and used water from the DI rinse, which is sent to the wastewater system. The floor of this area has collection sumps, in case of a release of acids; however, they do not connect to the wastewater system, and must be pumped out by hand.

Material Finishing
A number of different processes are used to finish parts prior to final assembly. These processes (grinding, machining, tumbling, extrude honing, etc.) produce a number of waste streams. Membrane filters, filtrate, grinding swarf, putty, aqueous cleaning solutions, tumbling media, and wastewater are all produced during these various processes. Some of these wastes are collected and reused (tumbling media), while others are shipped offsite for disposal. All wastewater is sent to the on-site wastewater treatment system for treatment prior to disposal.

Scrap metal processing
Scrap metal chips from machining activities are processed in the loading dock area. The chips are collected in a rolling cart and stored on the dock for pick-up by a recycling company. Trays are placed below the carts to capture oil. The oil collected is added into the waste oil accumulation containers on the loading dock next to the solvent storage room.

Laboratories
There are approximately 30 laboratories spread throughout the four onsite buildings, used for the design, testing, and quality control of new equipment and system components. The machines drain waste solvents and alcohols from system operation into collection containers located underneath the work benches on the floor. Other materials used are methanol, isopropyl alcohol, and acetone. In addition, the laboratories also create small amounts of acetonitrile and solvent wastes. The Hazardous Waste Manager inspects the collection containers daily, and removes full containers to the hazardous waste accumulation area in the solvent storage room.

Waste Storage Areas
All hazardous waste and waste oils from the 34 Maple Street facility are accumulated in the loading dock area (SWMU1) and adjacent solvent storage room (SWMU2). Waste caustic from the pretreatment system and oily debris are accumulated in one area of the dock, and waste acids are handled on the other side. All waste is drummed and stored in a contained area with labels indicating the contents, and the accumulation date. The area where the drums are stored is properly marked out, with access restrictions and secondary containment for the prevention of accidental release.

Waste solvents and oils are accumulated in 55-gallon drums in a marked area in the solvent storage room, which holds all the flammable materials stored in large quantities, both virgin and waste. Containers of waste solvents from the labs are brought into the solvent storage area, and emptied into the drum inside a hood station. The drums are then closed and replaced in the designated waste solvent drum storage area. (Ref. WA43).

There is also a smaller waste storage room located on the 5 Technology Drive property (SWMU3). This room holds very small quantities of waste solvents and alcohols generated from the testing and quality control laboratories present in this section of the facility. Waters maintains the two separate storage areas in order to minimize the distance, and thereby the risk or a release, from waste being trafficked through the facility.

Waters also maintains various satellite storage areas throughout the facility for both used oils and solvents. These areas are all properly marked out and labeled to their contents, and maintained by the Hazardous Waste Manager.

Industrial Wastewater Pre-Treatment System
Waters currently maintains a Grade 1 Industrial Wastewater Pre-Treatment System (SWMU4). Wastewater from the laboratory sinks, DI rinse water from the passivation line, and water treatment backwash are all sent into holding tanks for treatment.

The collected wastewater is treated by pH neutralization using sulfuric acid and caustic soda, and membrane filtration for all aqueous wastes. Additionally, an oil skimmer connected to a 55 gallon waste oil drum is attached to the holding tank. When the drum is filled, the waste oil is transported to the solvent storage room for disposal off-site.

The wastewater pH is neutralized around 7 SUs prior to discharge to the Town of Milford sanitary sewer system. The neutralization system operates at an average flow rate of approximately 3,000 gallons per day. A composite sample for metals is collected biannually, and the results are submitted to the EPA and the Town of Milford, as required.

Also included in the system is a batch process evaporator to minimize the amount of "solid" waste the treatment system generates by drying. Tailings from the evaporator are also transported to the solvent storage room for off-site disposal as hazardous waste.

Sumps are located around the room, with the concrete floor in good condition, sloped to drain into the sumps. Water from the sumps is automatically pumped into a holding tank before introduction into the neutralization tank (Ref. WA40).

Heating Oil
Two No. 2 fuel oil underground storage tanks (UST) are located along the front of the 34 Maple Street facility (AOC1). These tanks supply fuel for the generators located in the Maintenance Area. Both tanks are listed as 15,000 gallon double walled fiberglass tanks, manufactured by Owens Corning. The tanks have interstitial space monitoring, along with a level probe, which connect to the control panel. The oil supply lines from the tank are double walled and sealed at the pumpset. Sensor probes connected to the control panel are also located inside each piping sump. The control panel is located in the security office, which is manned 24 hours a day, 7 days a week. Based on information from the Milford Fire Department, these tanks were installed in approximately 1990 (Ref. WA49).

A total of three No. 2 fuel oil storage tanks are located around the buildings at 5 Technology Drive, one 2,500 gallon above ground storage tank (AST), one 1,000 gallon UST and one 2,000 gallon UST (AOC2). The leak protection capabilities of these emergency tanks are similar to the ones in place at 34 Maple Street. (Ref. WA42). As these tanks were not installed by Waters, the paperwork filed with the Milford Fire Department did not contain installation dates (Ref. WA49).

Stormwater
Waters does not have any outdoor storage facilities for oil or hazardous materials. All materials are located indoors, or within covered areas, with adequate secondary contaminant in the event of a spill or leak.

Stormwater is drained from the paved parking lot areas by catch basins located throughout the area. All catch basins drain to retention ponds located on the Waters property. Catch basins are equipped with absorbent inserts, thereby minimizing the possibility of any oil or hazardous material from entering the basin, and being transported to the retention pond.

Additionally, water from roof scuppers is either discharged to the ground, or directly to the underground piping leading to the retention ponds (Ref. WA42).

Waters currently maintains a "No Exposure Certification for Exclusion from NPDES Stormwater Permitting" certificate for their facility. The facility exclusion number is MARNEB628. This certificate states that the facility is granted exclusion from NPDES permitting and sampling requirements (Ref. WA43).

Historical Practices
Historically, Waters stored hazardous waste generated via the above listed processes on the premises of the facility for greater than 90 days. The hazardous waste was stored in three USTs (SWMU5) located on the north and western side of the current site building. Additionally, three virgin chemical tanks (AOC3) were located adjacent to the waste tanks. The locations of these tanks are presented in Figures 2a and 3a.

The three waste USTs were used to collect waste solvents generated in the manufacturing and testing processes for the development of HPLC analyzers.

Table 3 - Historic Waste USTs

Volume (gallons)	Type of Waste	Material	Installed	Removed	Details
2,000	Organic	carbon steel	April 1973	October 1985	methanol, toluene, acetone, acetonitrile
3,000	Aqueous	steel	February 1974	October 1985	aqueous mix of organic / chlorinated solvents and water soluble oils
3,000	Chlorinated	steel	October 1977	October 1985	methylene chloride, 1,1,1-trichloroethane

Originally, floor drains from the manufacturing and research / development areas were piped into the waste tanks. When the tanks were removed in 1985, the floor drains were all capped.

According to building schematics and facility personnel, no floor drains were ever connected into the wastewater pretreatment system, the sanitary sewer, or the storm water retention system.

In addition to the waste storage USTs, drummed waste was stored in the solvent storage building (SWMU2), a 46-foot by 32-foot by 12-foot metal storage building designed for the storage of flammable liquids. The building included a pitched floor to contain possible leaks or spills. The area also included virgin flammable material storage. The building was built as an addition to the main facility, opening in June 1978. The building was designed to hold and store up to 30 drums of waste oils, organic solvents, chlorinated solvents, and acids for long term storage. However, long-term storage in the building was discontinued in October 1985 at the same time as the removal of the USTs and other TSDF Closure activities. The same building area is currently used by Waters for the temporary storage of the same drummed wastes.

The three virgin material tanks were used in the manufacturing and testing process. There were two acetone tanks (a 1,000 gallon and a 3,000 gallon) and one toluene tank (1,000 gallon). It was determined that the amount of chemicals required in the processes no longer required the use of such large quantity tanks, and that the potential risks outweighed the usefulness. Waters decided to remove these tanks as part of the TSDF Closure performed in October 1985. (Ref. WA21).

4.2 Regulatory History

The following is a list of significant regulatory events at the Waters facility:

In May 1983, Waters filed a Part A Hazardous Waste Permit Application with the EPA, detailing that the facility was already operating as a TSDF under an interim status permit that had been granted to the facility in 1980 for the storage of waste solvents. At the time of the permit application, Waters maintained three waste solvent USTs on-site. Waters stated that it would not generate sufficient quantities to fill the USTs or accumulate enough drummed waste within a 90 day period to make it economical to ship the waste offsite as a generator, rather than storing it onsite as a TSDF. (Ref. WA04, WA06).

A number of solvents are used in the manufacturing and testing processes for the HPLC resins and columns. However, in the early 1980s, the majority of the manufacturing processes that generated waste solvents were moved from the Milford facility to a manufacturing facility maintained in Taunton, Massachusetts. After this move took place, far less waste was being generated at the Milford facility.

At this time, Waters determined that it was no longer desirable to maintain their status as a TSDF. In March 1985 they declined to submit a Part B Permit Application to finalize their status as a TSDF, instead deciding to change their status to Generator. In accordance with RCRA regulations, they submitted a closure plan on March 27, 1985 detailing the steps to be taken to close out the areas where hazardous wastes were stored at the facility. The closure plan detailed

that the three solvent storage USTs and associated piping were to be cleaned and removed from the ground, and the waste stored in drums in the long term drum storage area would be shipped offsite and the area would be decontaminated.

This report was also submitted to the Massachusetts Department of Environmental Quality Engineering (DEQE) on April 4, 1985. The DEQE acknowledged the request for a change in status in a letter addressed to Waters dated May 8, 1985.

Based on the DEQE approval, Waters closed the drum storage area by removing the drums stored there for longer than 90 days, and decontaminated the area. The area was kept intact as a storage area for virgin flammable materials, and temporary storage (less than 90 days) of flammable waste, prior to off-site shipment. The closure of the permanent drum storage area was completed and inspected by DEQE on August 23, 1985.

As closure activities of TSDF activities on-site had taken place, Waters submitted a letter to the DEQE certifying that they were no longer operating as a TSDF, on October 4, 1985. In this letter Waters stated they were continuing operations as a generator of hazardous waste.

In accordance with the closure plan, the closure and subsequent removal of the USTs began on October 10, 1985. Five of the six tanks were removed on October 10, 1985, the sixth remained onsite until sludge from the bottom could be removed on October 21, 1985, when it was also removed from the site, without incident. The DEQE was onsite for closure activities and was satisfied that the tanks and connecting piping were tight, and that the soil surrounding the tanks was clean and without odor (Ref. WA11).

On November 25, 1985 Waters submitted a letter to the DEQE certifying that they had completed the approved closure activities at the site, and the TSDF facilities had been closed in compliance with the plan.

Waters received a letter from the DEQE on December 16, 1985 stating that the DEQE had conducted inspections of the facility on August 23, 1985 and October 10, 1985 for the purpose of confirming the closure of the hazardous waste storage facilities. The DEQE certified in this letter that the closure had been satisfactorily completed, and that post closure activities would not be required at the facility under the DEQE Hazardous Waste Regulations.

In March 1986, Waters received a letter from the EPA stating that they were scheduled to undergo an audit. EPA stated since Waters was listed as a TSDF, they needed to ensure that they were operating in compliance with RCRA standards. While the Commonwealth of Massachusetts had been authorized by EPA to issue RCRA permits, they had not been authorized to address federal corrective action provisions, therefore EPA was planning to determine if any further action was needed in order to bring Waters into compliance. Waters responded to the EPA stating that since it was no longer a TSDF facility, the audit process was no longer necessary, as corrective action does not apply since the site had already gone through

formal closure. At the time of the request, the EPA was not aware that the Facility had undergone closure activities.

Formal closure of TSDF status by the DEQE was approved in a letter dated July 7, 1987. This closure approval contained a provision that the EPA may, at some future date, request information relative to waste related site activities.

On June 30, 1994, Waters was issued an Administrative Compliant by the EPA in regards to violations of the Clean Water Act resulting from the discharge of process related pollutants into a publicly owned treatment works (POTW). Waters responded to the EPA requests, and settled the issue by bringing their discharge into compliance with requirements by utilizing a wastewater pretreatment system prior to discharge to the POTW.

The MassDEP has one reported release of oil and/or hazardous materials listed for the Waters Facility (SWMU6). In 1996, a hydraulic oil line on a rented trash compactor ruptured, releasing about 15 gallons of hydraulic oil onto the asphalt pavement located beneath the compactor. The downgradient storm drain was protected from this release due to a berm of runoff sand that had built up around the storm drain. The asphalt surface impacted by the spill was inspected to reveal no cracks or discontinuities that could provide a pathway for migration of hydraulic oil into the environment. The standing oil stopped by the sand berm was removed using absorbent padding, and the impacted sand was removed and transported off-site for disposal. The release was closed out in the MassDEP system with a Class A-1 Response Action Outcome (RAO) statement indicating that the release had been remediated to background concentrations, and that no further impact to human health or the environment was present. All of the catch basins across the site now contain oil absorbent inserts to prevent contamination from entering them, and being discharged to the storm water retention basins (Ref. WA33).

5.0 ENVIRONMENTAL SETTING

5.1 Site Location and Setting

The Waters facility is located at 34 Maple Street, Milford, Massachusetts, in Worcester County. The geographical location of the facility is 42.137 latitude and -71.482 longitude. The location of the facility is shown on Figure 1. The Waters facility is bounded on the north and the south by vacant, wooded land. The facility is bounded to the east by the right of way for Interstate-495, and an office complex / industrial facility to the west. The property is located in a sparsely populated area zoned for light industrial use. The entire Waters property comprises approximately 45 acres and includes a 708,000 square foot building that was used for a combination of warehouse, manufacturing, laboratory, and office space.

5.1.2 Land Use

The Waters facility is currently active and is used for the manufacture and testing of HPLC instruments and other analytical instruments. The facility is maintained as the corporate headquarters for the Waters Corporation, and facility employees are present daily, as well as various people onsite for training and demonstration of equipment. According to facility representatives, the facility will remain operating for the foreseeable future with no changes.

There are no residences located in the vicinity of the facility. The facility is located in a sparsely populated industrial area, consisting of a few office, manufacturing, and warehouse facilities and undeveloped land.

5.1.3 Topography and Surface Water

The topography surrounding the Waters facility is generally level, with a slight slope from south to north in the northern section of the property. There is a steep downward slope along the eastern property boundary towards Interstate-495. The facility is surrounded by wetlands, and is located within the 100-year floodplain.

Stormwater runoff on the property is collected in catch basins located around the property, and in roof scuppers. Stormwater drainage on the 34 Maple Street property travels north and east to four man-made retention basins which were constructed to accommodate the volume of a "100-year flood". Stormwater drainage on the 5 Technology Drive property connects to outfalls located along the Interstate-495 retention basin located to the east of the building (Ref. WA42).

The Waters facility was granted exclusion from stormwater permitting under the EPA's NPDES Final Storm Water Phase II Rule. The exclusion number for the facility is MARNEB628 (Ref. WA41).

5.1.4 Geology and Hydrogeology

The Waters facility is located in the Holliston, Massachusetts Quadrangle of the United States Geological Survey (USGS) topographic map series. This map shows that the facility is situated on a local topographically high area.

In general, subsurface conditions in the area surrounding the site consist of a surficial topsoil layer with accompanying underlying natural subsoil, which overlies a natural deposit of glacial till. Apparent decomposed bedrock has been encountered at a number of locations around the site beneath the glacial till stratum.

The topsoil consists of just under one-foot of dark brown fine silt and sand, with approximately 20% organic content, typically roots and leaves. The subsoil is between one and two-feet thick,

and consists of a fine sand and silt mix, with additional organic material, some cobbles and coarse gravel, with occasional boulders. The glacial till consists of a fine to medium sand with some coarse gravel and little silt with few cobbles.

Decomposed bedrock in the area has been encountered at around 20 feet below ground surface to the west of the Site, and at depths as low as 73 feet below ground surface to the east of Maple Street. The decomposed bedrock consists of brown-purple angular course gravel, and the bedrock composition has been classified as consisting of alternating dark-grey to black schists, and lighter pink or white granitic materials (Ref. WA36, WA37).

According to the 1977 USGS Bedrock Geologic Map of the Holliston and Medfield Quadrangles, Middlesex, Norfolk, and Worcester Counties, Massachusetts, the bedrock composition in the vicinity of the Site is a biotite-hornblende schist consisting of light to dark-grey, bluish- to dark-greenish-grey, fine- to medium-grained, variably layered, biotite-hornblende schist, biotite-quartz-plagioclase gneiss, biotite-hornblende-epidote schist, and hornblende-biotite-epidote-plagioclase gneiss.

Groundwater occurs in two zones underlying the site. These zones included the unconsolidated water table aquifer and the underlying fractured bedrock aquifer. Groundwater in the unconsolidated zone in vicinity of the site has been measured between four and seven feet below ground surface. The groundwater in this zone has been found to flow in a south easterly direction.

A bedrock well exists on the Waters property, which was constructed prior to Waters purchasing the property. It is assumed to be a former supply well, but it is unclear who the well was constructed by as prior to the construction of the Waters facility, the land was listed as being vacant and undeveloped. This well was approximately 200 feet deep, and was originally in use as a potable water supply well. The well has not been in use since Waters purchased the land. According to available information, the well had never produced more than 7 gallons per minute of water.

Bedrock wells have been installed in and around the site, the purpose of these wells was for potential non-potable water supply development. According to information available from the MassGIS OLIVER website, it appears that the northern most stormwater retention basin is located adjacent to but not within a Zone II classified area (Ref. WA37; WA50).

No groundwater monitoring wells have been installed on the 34 Maple Street property, as there have been no recorded releases of any oil or hazardous materials impacting subsurface conditions on the property.

Three monitoring wells do exist on the 5 Technology Drive property, which were installed during an ASTM Phase I Real Estate investigation of the property, prior to the purchase of the facility by Waters. The soils encountered during the installation of these three wells, as well as

the groundwater were screened by a state-certified laboratory for quantitative analysis. Soil samples were screened for metals, pesticides, and extractable and volatile petroleum hydrocarbons. The samples submitted did not indicate the presence of any contamination on the site. Groundwater samples collected from the monitoring wells were analyzed for volatile organic compounds, as well as extractable and volatile petroleum hydrocarbons. Low concentrations of organics, below their respective MassDEP reportable standards, were detected in groundwater in one of the three wells (the well adjacent to a 1,000 gallon fuel oil UST). Out of the four constituents detected, one, acetone, detected at 55.2 µg/L, is a common laboratory contaminant. The remaining three constituents, benzene, toluene, and 1,2,4-trimethylbenzene were detected at concentrations of 1.0 µg/L, 1.4 µg/L, and 1.1 µg/L, respectively. The MassDEP reportable standards for this site are RCGW-2, which are approximately 2 orders of magnitude greater than the detected concentrations (Ref. WA39).

6.0 SWMU AND AOC DESCRIPTIONS

Based on the PR and information gathered during the VSI, a total of six SWMUs and four AOCs were identified at the Waters facility. The names of these SWMUs and AOCs are listed in Attachment 1 and their locations are identified on Figures 2 and 3. Photographs of the site, the SWMUs, and the AOCs taken during the VSI are included in Appendix B.

6.1 SWMU 1 – Loading Dock Area

TYPE OF UNIT: a. Drum Storage Area
b. Roll off Containers

PERIOD OF OPERATION: 1973 to present

PHOTOGRAPH NUMBER(S): 10, 12 through 15

PHYSICAL DESCRIPTION AND CONDITION:

Waste caustic from the wastewater pretreatment system is accumulated in drums in one area of the loading dock. Waste acid is drummed and accumulated in a separate area of the loading dock. All waste is drummed and stored in a contained area with labels indicating the contents and the accumulation dates. The areas where the drums are stored are properly marked out, with access restrictions and secondary containment for the prevention of an accidental release.

Oily metal debris from the metals machining process is accumulated in roll off containers in the middle section of the area. The metals are allowed to drain, and the waste oil is collected and stored in drums in the adjacent solvent storage room (SWMU2).

Virgin acids are also stored in this area. There is a small holding sump for spills, connected to a retention tank that is part of the Wastewater Pretreatment System (SWMU 4).

The area is covered by a roof, and has two solid walls, but also has open air ventilation through two sides, which are constructed of slated chain link fence. The fence is kept locked, and a gate in the fence leads to the loading dock.

The sumps and secondary containment were empty and clean, and the concrete floors and walls were in good condition with minimal staining present.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Three separate wastes are managed in this area. Waste acid and caustic from operational processes are stored in drums in separate areas of the shed. These drums are placed on appropriate secondary contaminant in order to contain accidental releases. Oily waste metal shavings are maintained in roll off bins located between the waste acid and caustic.

RELEASE PATHWAYS:	Air (L)	Surface Water (L) Groundwater (L)	Soil (L) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

At the time of the VSI, this unit was in good condition. No stains were noted on the floor, and the concrete was in good condition. There was no evidence of previous spills inside the secondary containment areas.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
As there are no reported releases from this unit, and because of the excellent housekeeping procedures associated with this unit, the good structural condition of the floor, and the presence of secondary containment, it does not appear necessary that sampling be performed to investigate the potential for release of hazardous constituents.

6.2 SWMU 2 – Solvent Storage Room

TYPE OF UNIT: Drum Storage

PERIOD OF OPERATION: 1973 to present

PHOTOGRAPH NUMBER(S): 9 and 11

PHYSICAL DESCRIPTION AND CONDITION:

The drum storage room consists of a 46-foot by 32-foot by 12-foot metal storage building designed for the storage of flammable liquids. The building includes a pitched concrete floor in good condition to contain possible leaks or spills. The area was designed to store up to 30 drums of waste oils, organic solvents, or chlorinated solvents for long term-storage. However, long-term storage in the building was discontinued in 1985. Generally, the room holds approximately 10 to 12 drums of waste. Open drums are stored and filled inside a fume hood, and sealed drums are stored in the center of the room with adequate spacing until they are shipped offsite for disposal.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The Solvent Storage Room stores both waste solvents from the manufacturing and testing processes as well as waste oils from machining and equipment maintenance. Additionally, virgin oil and solvent drums are stored in this area.

RELEASE PATHWAYS:	Air (L)	Surface Water (L) Groundwater (L)	Soil (L) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

Originally, this area was constructed and used to store drums for periods longer than 90 days in connection with the TSDF status maintained by the facility. When the decision was made to change to Generator status in 1985, the drums stored onsite were removed, and the area was cleaned and closed as part of the TSDF Closure Plan. The area continues to be used for short-term (less than 90 day) storage of waste drums prior to off-site transport and disposal.

There have been no releases reported in connection with the operation of this area. Additionally, the concrete floors are in good condition, with no evidence of spills. The area is kept locked and is maintained by a supervisor during operational hours.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
As there are no reported releases from this unit, and because of the excellent housekeeping procedures associated with this unit, the good structural condition of the floor, and the presence of secondary containment, it does not appear necessary that sampling be performed to investigate the potential for release of hazardous constituents.

6.3 SWMU 3 – Waste Storage Room

TYPE OF UNIT: Flammable Storage Area

PERIOD OF OPERATION: 2008 to present

PHOTOGRAPH NUMBER(S): 16

PHYSICAL DESCRIPTION AND CONDITION:

The Waste Storage Room is located on the first floor of Building C at 5 Technology Drive. The room was originally used for storage of supplies, and was converted into a storage area for flammable wastes (solvents). There are two flammable cabinets located in the room, as well as a hood containing two active drums. Virgin solvents are stored in one corner of the room on secondary containment pallets.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Small quantities of waste solvents that are used in the laboratories at 5 Technology Place are stored in this room. The Waste Manager will take filled waste solvent cans from the various labs and carry them down into the Waste Solvent Room. These cans are then emptied into drums stored in the fume hood area. Approximately one drum is filled every two months. Filled drums are collected and transported offsite for disposal by a licensed waste hauler.

RELEASE PATHWAYS:	Air (L)	Surface Water (L) Groundwater (L)	Soil (L) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

There have been no releases reported in connection with the operation of this area. Additionally, the floors are in good condition, with no evidence of spills. The area is kept locked and is under security supervision.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
As there are no reported releases from this unit, and because of the excellent housekeeping procedures associated with this unit, the good structural condition of the floor, and the presence

of secondary containment, it does not appear necessary that sampling be performed to investigate the potential for release of hazardous constituents.

6.4 SWMU 4 – Wastewater Pretreatment System

TYPE OF UNIT:

a. Membrane Filters
b. Neutralization Tank
c. Batch Evaporator

PERIOD OF OPERATION: 1994 to present

PHOTOGRAPH NUMBER(S): n/a

PHYSICAL DESCRIPTION AND CONDITION:

Historically, process wastewater was discharged into the POTW sanitary sewer without pretreatment. However, in 1994, Waters was cited for violation of the Clean Water Act and issued a Consent Agreement stating that Federal regulations require pretreatment before discharge. Based on EPA observations, Waters violated pretreatment effluent limits for pH, chromium, and certain toxic organics used in metals finishing (Ref. WA27).

Currently, Waters operates a Grade 1 Industrial Wastewater Pre-treatment system. The system collects wastewater from laboratory sinks, DI rinse water from the passivation line, and water treatment backwash. The system consists of pH neutralization using sulfuric acid and caustic soda, membrane filtration, and a batch process evaporator with an oil skimmer.

The entire system is submerged in a concrete sump for secondary containment. In the event of a leak, wastewater in the sump can be pumped into a 1,000 gallon emergency storage tank.

The system is in good operating condition, and is sampled as required. Reports on operating conditions and parameters are submitted to the Town of Milford and the EPA (Ref. WA38, WA40).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

According to information provided by facility representatives, the system manages and generates three main types of waste: wastewater, waste oil, and evaporator tailings.

Influent water is neutralized, and then sent through a membrane filtration system. When necessary, the filtration system is backwashed in order to clean the filters, and this backwash water is sent to the influent holding tanks. Treated wastewater is neutralized to a pH of approximately 7 SU and discharged to the POTW. The system operates at an average flow rate of 3,000 gallons per day.

Both the waste oil and the tailings are generated as part of the batch evaporation process. Metal

parts machined on-site can contain small amounts of lubrication oil, which are washed off during passivation and other parts of the finishing processes. An oil skimmer connected to a 55-gallon waste oil drum is attached to the evaporator storage tank. Any oil collected in the wastewater is drummed and when full, the drum is stored in the Solvent Storage Room (SWMU 2) until it can be shipped off-site.

Tailings remaining after the evaporation process is complete are collected and drummed after each operation. These tailings are stored in the drum storage area, and shipped off-site as hazardous waste.

RELEASE PATHWAYS:	Air (L)	Surface Water (L) Groundwater (L)	Soil (L) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

There have been no releases reported in connection with the operation of this area. Additionally, the floors are in good condition, with no evidence of spills. The area is kept locked and is under security supervision.

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
As there are no reported releases from this unit, and because of the housekeeping procedures associated with this unit and the presence of secondary containment, it does not appear necessary that sampling be performed to investigate the potential for release of hazardous constituents.

6.5 SWMU 5 A, B, and C – Former Waste USTs and SWMU 5D – Former Floor Drains

TYPE OF UNIT: Waste storage USTs with associated floor drains

PERIOD OF OPERATION: 1970s (varies) to 1985

PHOTOGRAPH NUMBER(S): 7

PHYSICAL DESCRIPTION AND CONDITION:

Historically, Waters stored hazardous wastes generated in the manufacturing and testing processes onsite in three USTs located on the northern and western sides of the building. Additionally, floor drains located inside the manufacturing area were piped into these USTs.

These tanks were all removed from the site as part of the Clean Closure of TSDF activities which occurred in 1985. The floor drains were capped prior to the USTs being removed from service. Clean closure was certified by the DEQE, and that the tanks and associated piping were tight, that the soils surrounding the tanks were shown to be clean and without odor, and that post closure activities were not required at the facility under DEQE Hazardous Waste Regulations (Ref. WA20).

Originally, floor drains from the manufacturing and research / development areas were piped into the waste tanks. When the tanks were removed in 1985, the floor drains were all capped. According to building schematics and facility personnel, no floor drains were ever connected into the wastewater pretreatment system, the sanitary sewer, or the storm water retention system and all drains were piped into the waste USTs.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The waste stream managed by this unit consisted of waste organics and solvents generated in the manufacturing and research and development activities performed on-site. The floor drains connected the manufacturing floor where these chemicals were used to the waste USTs.

SWMU #	Volume (gallons)	Type of Waste	Material	Installed	Removed	Details
5A	2,000	Organic	carbon steel	April 1973	October 1985	methanol, toluene, acetone, acetonitrile
5B	3,000	Aqueous	steel	February 1974	October 1985	aqueous mix of organic / chlorinated solvents and water soluble oils
5C	3,000	Chlorinated	steel	October 1977	October 1985	methylene chloride, 1,1,1-trichloroethane

RELEASE PATHWAYS:	Air (L)	Surface Water (L) Groundwater (M)	Soil (M) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

According to facility representatives, no releases of nonhazardous or hazardous waste from this unit have occurred. Although no evidence of a release from this unit was identified in the available file material, no confirmatory sampling was performed when the drains were capped or when the USTs were removed.

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	(X)
	RFI Necessary	( )

COMMENTS:
While the tanks had been tightness tested prior to removal and appeared tight, and the DEQE certified that the excavations appeared visually clean, many solvents are clear in color. Confirmatory sampling to ensure that the USTs had no impact to the subsurface was never been performed in the area surrounding the tanks.

Additionally, no sampling or investigation was performed prior to capping the floor drains to determine if the pipes connecting the drains to the USTs had corroded, cracked, or leaked.

6.6 SWMU 6 – Domestic Waste

TYPE OF UNIT: Trash Compactors

PERIOD OF OPERATION: 1973 to present

PHOTOGRAPH NUMBER(S): 21, 22

PHYSICAL DESCRIPTION AND CONDITION:

A number of rented trash compactors are present around the exterior of the facility. These units collect domestic waste and compress and store it for off-site landfill disposal. The trash compactors can contain up to 45 cubic yards of waste, and are rented from E.L. Harvey & Sons, a waste and recycling management company. Trash in the building is collected in receptacles, which are emptied into the compactors by janitorial staff and regular intervals throughout the week.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Trash compactors contain domestic waste for off-site landfill and disposal. Additionally, the trash compactors operate hydraulically, and contain approximately 15-gallons of hydraulic oil.

RELEASE PATHWAYS:	Air (L)	Surface Water (L) Groundwater (L)	Soil (M) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

There have been no releases of waste reported in connection with the operation of this area; however there was one reported release of hydraulic oil from a compactor. The pavement around each of the compactors is in good condition, with no evidence of waste spills.

In 1996, the hydraulic oil line on one of the rented trash compactors ruptured, releasing approximately 15-gallons of hydraulic oil onto the asphalt pavement surrounding the compactor. The oil did not enter a downgradient storm drain due to a berm of runoff sand that had built up around the storm drain. No oil was present inside of the catch basin. The standing oil stopped by the sand berm was removed using absorbent padding, and impacted sand was removed and transported off-site for disposal. The asphalt impacted by the spill was inspected, and showed no cracks or discontinuities that could provide a pathway for migration of the hydraulic oil into the subsurface environment. Additionally, the storm water outfall connected to this catch basin was routinely monitored and showed no signs of petroleum impacts.

As the release did not penetrate the asphalt or impact the catch basin, it was considered unlikely that soils or water were impacted. The release was closed in the Mass DEP system under a Class A-1 RAO, stating that the release had been remediated to background conditions, and that no impact to human health or the environment was present.

As a preventative measure, all catch basins across the Site now contain oil absorbent inserts which are routinely inspected and changed out (Ref. WA33).

RECOMMENDATION:	No Further Action	(X)
	Confirmatory Sampling	( )
	RFI Necessary	( )

COMMENTS:
As there are no reported releases of waste from this unit, and because of the housekeeping procedures associated with this unit and the type of wastes managed, it does not appear necessary that sampling be performed to investigate the potential for release of hazardous constituents.

A Class A-1 RAO was filed with MassDEP for the release of hydraulic oil upon completion of remedial activities associated with the release. This submittal indicates that the asphalt prevented penetration of the oil into soils and the catch basin was not impacted therefore the release was remediated to background conditions and no further action is necessary. In order to prevent future releases, all catch basins onsite are now lined with oil absorbent inserts which are routinely inspected and changed.

6.7 AOC 1 – Heating Oil USTs

TYPE OF UNIT: Fuel oil USTs

PERIOD OF OPERATION: 1990 to present

PHOTOGRAPH NUMBER(S): 20

PHYSICAL DESCRIPTION AND CONDITION:

Two No. 2 fuel oil USTs are located along the front of the 34 Maple Street facility. These tanks supply fuel for the generators located in the maintenance area and the heating system. Both tanks are 15,000 gallon double walled fiberglass, with interstitial monitoring. Sensors both in the tanks and the lined oil supply lines connect to a control panel located in the main security office, which is manned 24 hours a day, 7 days a week. There have been no reported issues with these tanks. Based on information collected from the Milford Fire Department, the tanks currently in use were installed in July 1990. It appears they may have replaced older tanks that were in use from the 1970s (one 15,000 gallon and one 10,000 gallon UST in approximately the same locations).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Both tanks contain No. 2 fuel oil used for power and heat generation in the main facility. No wastes have been managed in this area.

RELEASE PATHWAYS:	Air (L)	Surface Water (L) Groundwater (M)	Soil (M) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material. In addition, according to facility representatives, no releases of oil from this unit have ever occurred.

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	(X)
	RFI Necessary	( )

COMMENTS:
While there have been no reported releases from this unit, due to the age of the existing tanks and that older tanks were replaced, it is recommended that confirmatory sampling of soils and/or groundwater be performed in this area to investigate the potential for release of oil.

6.8 AOC 2 A, B, and C – Emergency Generator Tanks

TYPE OF UNIT: Fuel oil AST (1)
Fuel oil USTs (2)

PERIOD OF OPERATION: 1980s to present

PHOTOGRAPH NUMBER(S): 17, 18, 19, and 24

PHYSICAL DESCRIPTION AND CONDITION:

Three emergency generators are located around the building at 5 Technology Drive. These three generators each have a No. 2 fuel oil tank associated with it: one 2,500-gallon AST (AOC 2A), one 1,000-gallon UST (AOC 2B), and one 2,000-gallon UST (AOC 2C). Each tank has leak prevention capabilities. All three tanks are in operable condition, and have not had any reported releases (Ref. WA42).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

The tanks contain No. 2 fuel oil used for emergency power generation in the facility. No wastes have been managed in this area.

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (M)
Groundwater (M) Subsurface Gas (L)

L – Low M – Medium H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

During an ASTM Phase I Real Estate Investigation of the 5 Technology Drive property performed in 2004 prior to its purchase by Waters, three groundwater monitoring wells were installed in order to determine if there had been impacts to subsurface conditions from prior on-site operations. Subsurface soil and groundwater samples were obtained from each of the three locations. The soil samples did not indicate the presence of any contaminants. Low concentrations of petroleum hydrocarbons were detected in groundwater from the monitoring well located adjacent to the 1,000 gallon UST (AOC 2B). However, these detected concentrations were well below their respective MassDEP Reportable Concentrations.

Compound	Acetone	Benzene	Toluene	1,2,4-Trimethylbenzene
Detected Concentration (µg/L)	55.2	1.0	1.4	1.1
Reportable Concentration RCGW-2	3,000	2,000	6,000	none

The documentation submitted by Waters to the Milford Fire Department does not indicate the age of these tanks, they were in use prior to the acquisition of the property by Waters in 2004. Paperwork submitted by Waters to the Fire Department in 2005 indicated that the tanks had been taken temporarily out of service and tightness-testing and permits for these tanks are all up-to-date.

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	(X)
	RFI Necessary	( )

COMMENTS:
The levels of petroleum hydrocarbons detected in the monitoring well adjacent to the 1,000 gallon UST (AOC 2B) were approximately 2 orders of magnitude less than their respective MassDEP reportable concentrations, indicating a release of oil from the tank is unlikely. Additionally, these tanks are routinely tightness tested to ensure the tanks are sound and leaks are not present. To date, no issues with these tanks have been noted.

However, since the tanks were installed in the 1980s and the tanks have been temporarily taken out of service, the existing downgradient monitoring wells should be re-sampled.

6.9 AOC 3 A, B, C – Former USTs

TYPE OF UNIT: Virgin material USTs

PERIOD OF OPERATION: 1970s (varies) to 1985

PHOTOGRAPH NUMBER(S): n/a

PHYSICAL DESCRIPTION AND CONDITION:

Historically, Waters utilized large quantities of organic solvents and chemicals in the research and development and manufacturing processes occurring on-site. The chemicals were stored in three USTs located on the northern and western sides of the building.

These tanks were all removed from the site as part of the Clean Closure of TSDF activities which occurred in 1985. Clean closure was certified by the DEQE, and that the tanks and associated piping were tight, that the soils surrounding the tanks were shown to be clean and without odor, and that post closure activities were not required at the facility under DEQE Hazardous Waste Regulations (Ref. WA20).

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

No wastes have been managed in this area. The three USTs were used to store virgin materials used in the manufacturing and research and development activities performed on-site.

AOC #	Volume (gallons)	Type of Material	Removed
3A	1,000	Acetone	October 1985
3B	3,000	Acetone	October 1985
3C	1,000	Toluene	October 1985

RELEASE PATHWAYS: Air (L) Surface Water (L) Soil (M) Groundwater (M) Subsurface Gas (L)

L – Low M – Medium H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

According to facility representatives, no releases of nonhazardous or hazardous waste from this unit have occurred. Although no evidence of a release from this unit was identified in the available file material, no confirmatory sampling was performed.

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	(X)
	RFI Necessary	( )

COMMENTS:
While the tanks had been tightness tested prior to removal and appeared tight, and the DEQE certified that the excavations appeared visually clean, many solvents are clear in color. Confirmatory sampling to ensure that the USTs had no impact to the subsurface was never been performed in the area surrounding the tanks.

6.10 AOC 4 – Roof Vents

TYPE OF UNIT: Roof Vents from operational activities

PERIOD OF OPERATION: 1970s (various) through present

PHOTOGRAPH NUMBER(S): n/a

PHYSICAL DESCRIPTION AND CONDITION:

Roof vents exist in a number of locations across the buildings. These vents are associated with the HVAC system, as well as provide ventilation for operational and manufacturing activities within the facility. Additionally, there are a number of downspouts off of the roof that provide a path for stormwater from the roof of the facility to the stormwater detention system.

WASTES AND/OR HAZARDOUS CONSTITUENTS MANAGED:

Air ducts are connected to each machine used in the manufacturing process to collect smoke and oil vapor created by the machining process. The air is then off-gassed through stacks located on the roof of the facility.

RELEASE PATHWAYS:	Air (M)	Surface Water (M) Groundwater (L)	Soil (M) Subsurface Gas (L)
	L – Low	M – Medium	H- High

HISTORY AND/OR EVIDENCE OR RELEASE(S):

No evidence of a release from this unit was identified in the available file material.

RECOMMENDATION:	No Further Action	( )
	Confirmatory Sampling	(X)
	RFI Necessary	( )

COMMENTS:
In general, with roof vents from manufacturing processes, it may be that portions of the roof can become contaminated with site specific chemicals which can be absorbed by stormwater that collects on the roof which is then transported via the downspouts to the ground.

While a stormwater sampling program was in place at various outfalls across the site, there was no mention of stormwater sampling from roof drains. If this data exists, it should be provided for review. If it does not exist, sampling of the roof drains is recommended utilizing a stormwater sampling protocol and should be analyzed for site specific chemicals.

7.0 REFERENCES

Reference	Document Date	Title	Author
WA01		Drawing Tank Locations	
WA02		Building Floor Plan	
WA03		Wastewater Treatment Manual	
WA04	1981 March 27	Interoffice Memo Closure and Post-Closure Care and Financial Responsibility (40 CFR Part 265)	Marg Ransom
WA05	1981 May 8	M.S.F. Closure Plan SOP #36	G. Bliss
WA06	1983 May 13	EPA Form - Hazardous Waste Permit Application	Thomas Feller
WA07	1985 March 26	Waters does not submit Part B Applic. Change to Haz Waste Generator Status	Water Associates William Stares Manager of Facilities
WA08	1985 March 27	Closure Plan (3 pages)	Water Associates
WA09	1985 April 4	Attached copy of Closure Plan and copy of test results for the underground storage tank testing performed in April 1984	William Stares Manager of Facilities
WA10	1985 May 8	Re: Your request of March 26, 1985	MassDEP Steven DeGabriele
WA11	1985 May 30	Letter in response to your letter dated May 8, 1985 and your request for Waters Assoc to operate as a generator of haz waste.	Waters Associates William Stares Manager of Facilities
WA12	1985 June 14	Re: CRHM & SWS – Milford Facility Closure	MassDEP John A. Desmond, Chief Solid and Haz Waste
WA13	1985 June 14	Re: CRHM & SWS – Milford Facility Closure	MassDEP John Desmond
WA14	1985 October 4	Submit Certification operating only as a generator of hazardous waste (2 copies)	Millipore William B. Stares Manager of Facilities
WA15	1985 October 21	Uniform Hazardous Waste Manifest Waste Flammable Solid	MassDEP
WA16	1985 November 25	Ltr certifying that Waters has completed Closure Plan	William B. Stares Manager of Facilities
WA17	1985 November 27	Memo Re: Closure at Milford Site	Robert Connors

Reference	Document Date	Title	Author
WA18	1985 December 6	Waters has completed its closure plan (2 copies)	Millipore John McDonough Project Manager
WA19	1985 December 10	Ltr stating Waters has recently completed Closure Plan.	Millipore William B. Stares
WA20	1985 December 16	DEP conducted inspection of facility for purpose of confirming closure of haz waste facility	MassDEP John Desmond
WA21	1986 March 31	Request for Information Pursuant to §3007 of the Resource Conservation and Recovery Act, 42 U.S.C. §6927, and §104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C §9604	US EPA
WA22	1986 April 23	Re: Letter from Merrill S. Hohman, Director-Waste Mngmt Div., March 31, 1986. Request for Information Pursuant to §3007 of the Resource Conservation and Recovery Act, 42 U.S.C. §6927, and §104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C §9604	Waters (Div. of Millipore) Marquand S. Ransom
WA23	1986 May 7	Re: Letter from Merrill S. Hohman, Director-Waste Mngmt Div., March 31, 1986. Request for Information Pursuant to §3007 of the Resource Conservation and Recovery Act, 42 U.S.C. §6927, and §104 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C §9604	Waters (Div. of Millipore) Marquand S. Ransom
WA24	1987 July 7	Response to your letter of October 4, 1985 requesting change of status to Generator of Haz Waste	MassDEP Steven A. DeGabriele Acting Deputy Chief
WA25	1994 February 1	Request for Information Pursuant to Section 308 of the Clean Water Act, Docket No. 94-308P-027	US EPA David Fierra

Reference	Document Date	Title	Author
WA26	1994 February 28	Request for Information Pursuant to Section 308 of the Clean Water Act Docket No. 94-308p-027, dated February 1, 1994	Millipore
WA27	1994 June 29	EPA Enforcement Action for Clean Water Act Violations at the Millipore Corporation Facility in Milford, MA	Millipore
WA28	1994 July 1	Notice of Proposed Assessment of a Civil Penalty Docket No. CWA-2-I-94-1064	US EPA John DeVillars
WA29	1994 July 5	Millipore Cited for Environmental Violations	Alice Kaufman Office of External Programs
WA30	1994 October 31	BWP-Milford Report of Inspection of October 31, 1994	MassDEP
WA31	1994 November 2	In the Matter of Millipore Corporation Docket No. CWA-2-I-94-1064	Millipore Harry M. Carey, Jr.
WA32	1996 June 3	Release Notification and Notification Retraction Form	Philip Nicewonger, Site Inspector - CleanHarbors
WA33	1996 July 8	Response Action Outcome Statement	Philip Nicewonger, Site Inspector - CleanHarbors
WA34	2000 May 16	MARNEB628 Certificate "No Exposure Certification for Exclusion from NPDES Storm Water Permitting"	From EPA
WA35	2000 November	Contingency Plan	Waters Corporation
WA36	2001 January	Geotechnical Engineering Studies	The Geotechnical Group
WA37	2001 June 12	Non Potable Water Supply Development Parcels F & G Maple Street	Beals and Thomas Inc.
WA38	2003 June 2	Unannounced inspection of Waters Corp.	John T. Stapler, Jr. BWP C/E, DEP/CERO
WA39	2004 June 3	Environmental Site Assessment Services	TGG Environmental, Inc.
WA40	2005 February 24	Clean Water Act Inspection	US EPA Joseph Canzano

Reference	Document Date	Title	Author
WA41	2005 March 5	Tracking No. MANOE237 Ltr acknowledges submittal of complete No Exposure Certification for exclusion from NPDES Stormwater Permitting form.	US EPA
WA42	2007 July 13	SPCC Plan	Peter Hicks (Signed) Facility Manager
WA43	2007 October 1	Report of Inspection of September 21, 2007	MADEP Inspector Giles Steele-Perkins
WA44	2008 January	Contingency Plan	Waters Corporation
WA45	2008 July 1	Environmental Site Assessment	TGG
WA46	2008 September	Envirofacts (http://www.epa.gov/enviro/index.html)	US EPA
WA47	2008 September	Waters Corporation (http://www.waters.com)	Waters Corporation
WA48	2008 September	Town of Milford, MA (http://www.milford.ma.us)	Town of Milford, MA
WA49	multiple dates	Milford Fire Department Records for UST/ASTs at the Waters Facility	Town of Milford Fire Department
WA50	2011 July 5	GIS Map including IWPA and Zone II GW features	Mass GIS Department, OLIVER website

FIGURE 1

Location Map for the Waters Corporation Facility

WATERS TECHNOLOGIES CORP. (MILLIPORE)

34 MAPLE STREET MILFORD, MA

Mabbett & Associates
Environmental Consultants & Engineers

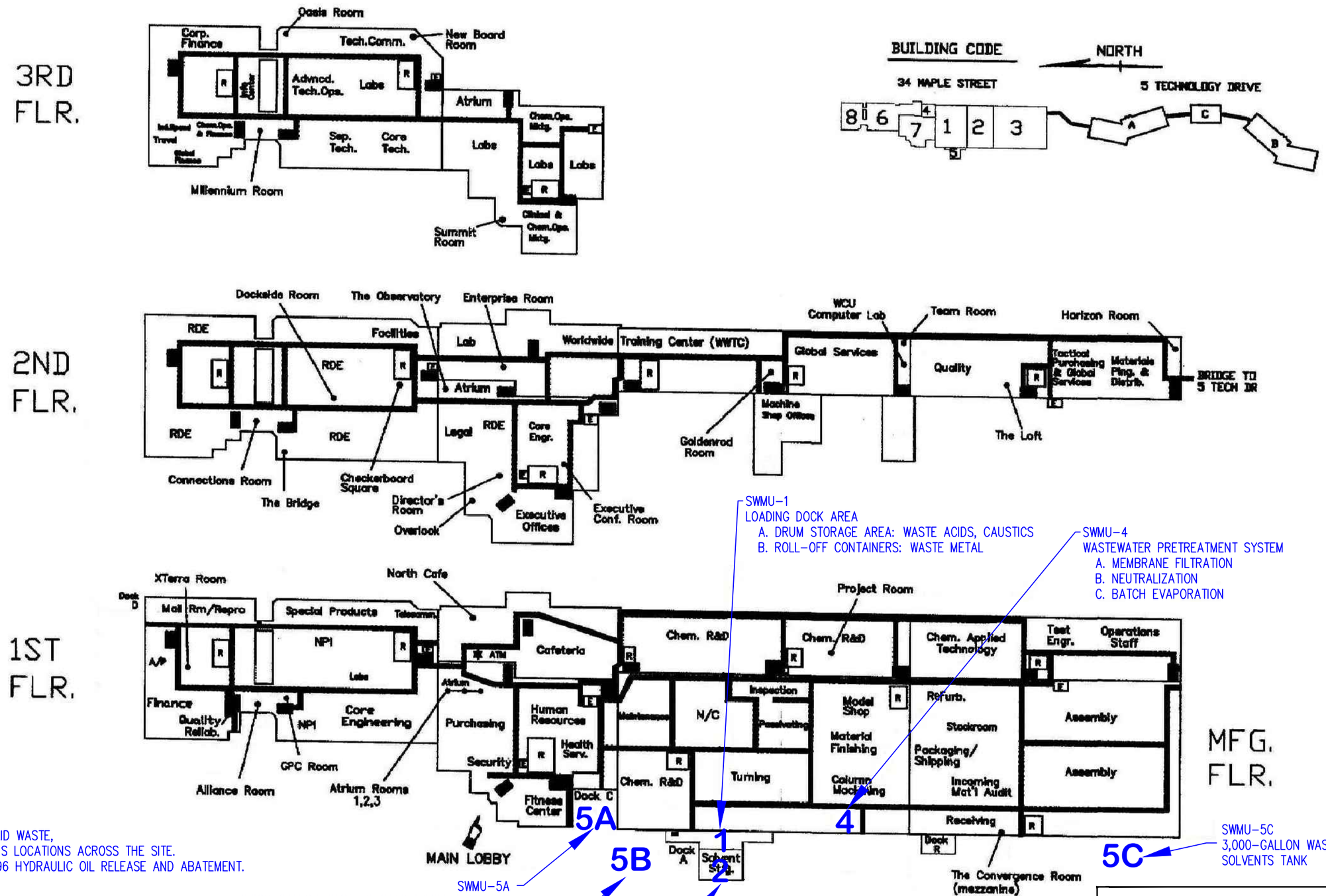
SITE LOCUS MAP

DWG. NO. L-1

DRAWN DJA	APPROVED KBS	SCALE 1"=2000'	PROJ. NO. 7051012.001

FIGURE 2

Waters Corporation SWMU Map



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WATERS TECHNOLOGIES CORP. (MILLIPORE)
34 MAPLE STREET MILFORD, MA

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Mabbett & Associates
Environmental Consultants & Engineers

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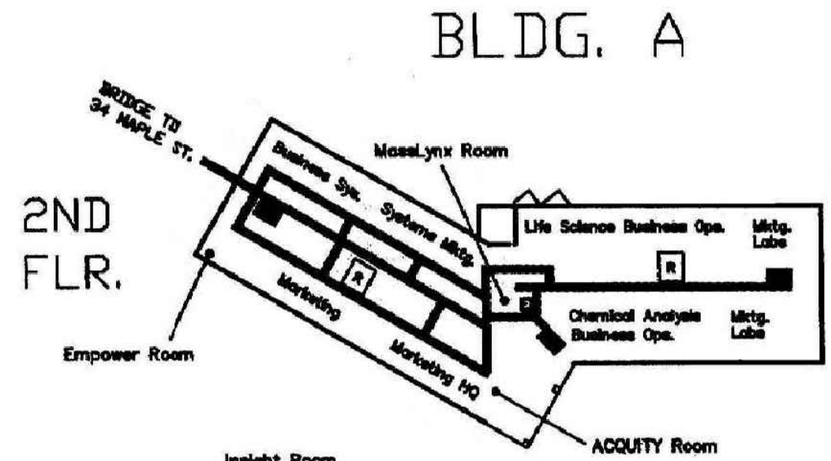

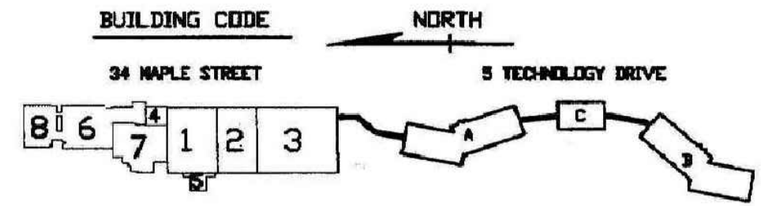

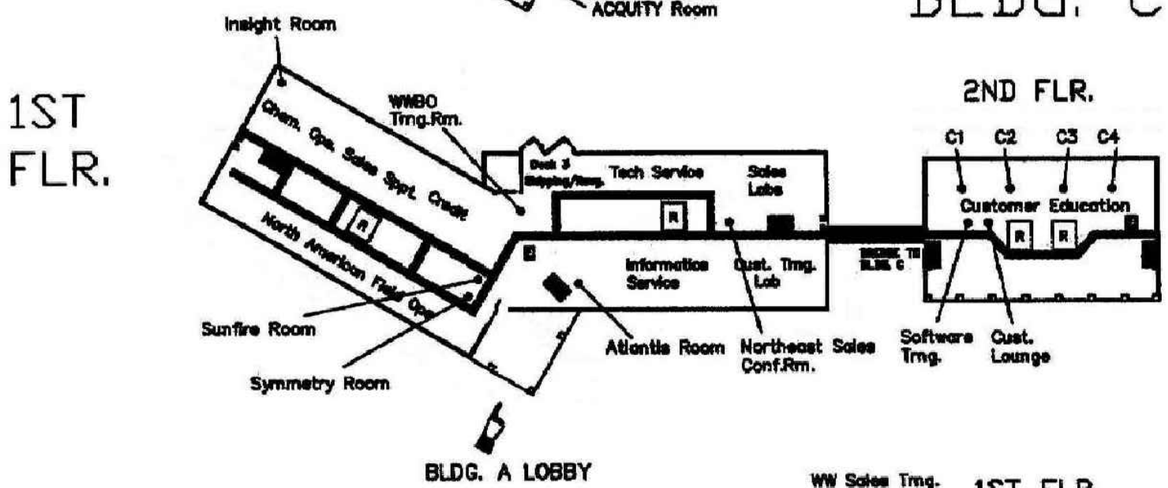

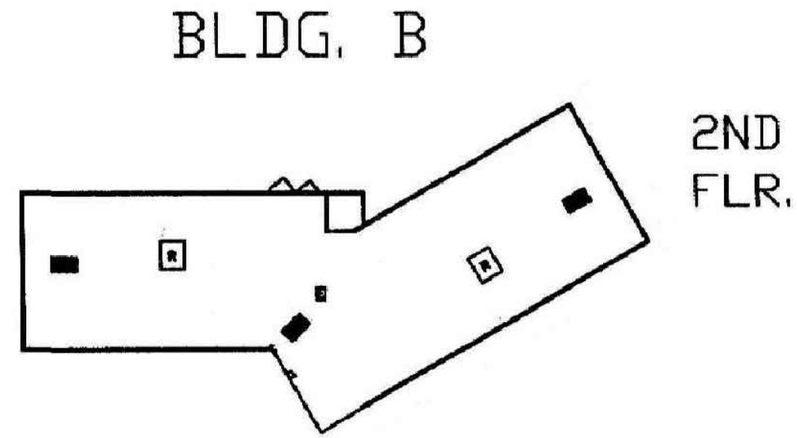

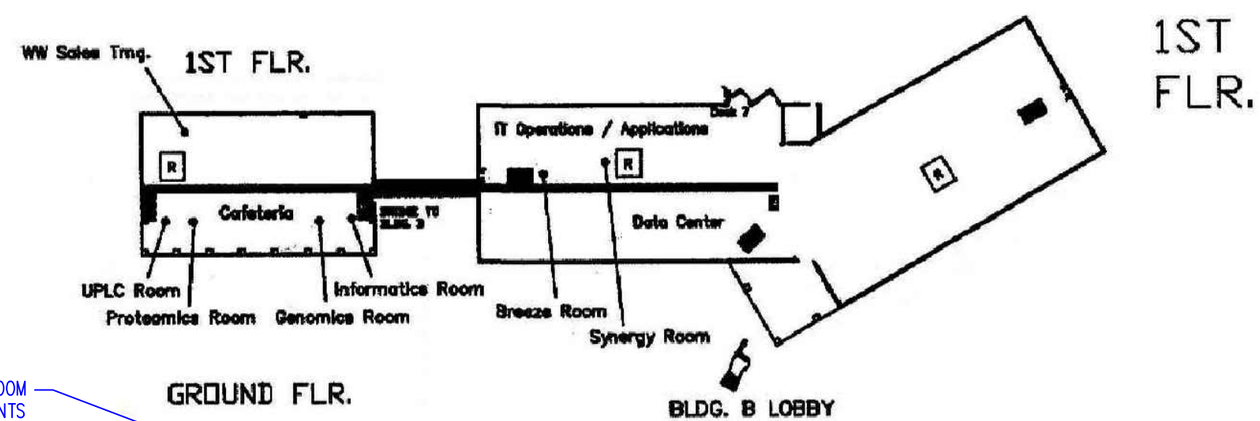

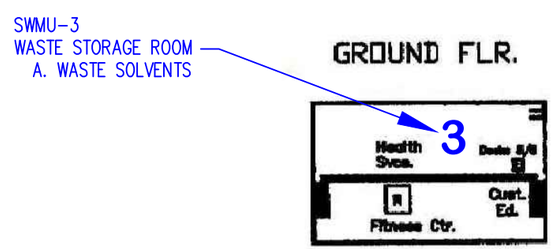

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FIGURE 3

Waters Corporation AOC Map

WATERS TECHNOLOGIES CORP. (MILLIPORE)
31 MAPLE STREET MILFORD, MA

SOURCE:

FIGURE L-3 IS BASED ON A BUILDING LAYOUT MADE BY CLIENT.
(NO DATE INDICATED ON PLAN

.	DATE	DESCRIPTION	DRN	CHK	
		REVISION			

DRAWN BY: DJA
APPROVED BY:
CONSTRUCTION MANAGER
DRAWING NO. L-3A
PROJ. NO. 7051012.001

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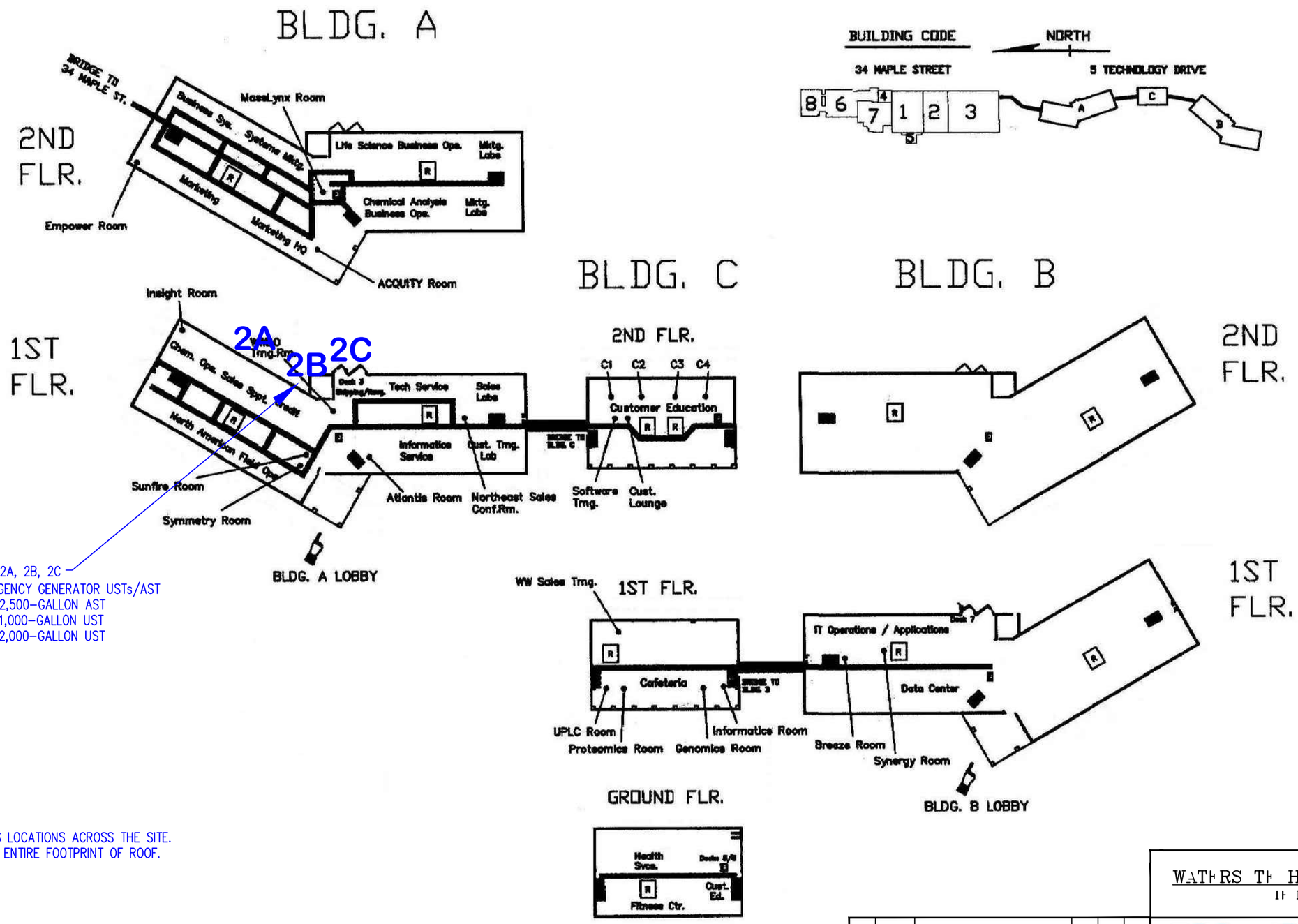

AOC-2A, 2B, 2C
EMERGENCY GENERATOR USTs/AST
A. 2,500-GALLON AST
B. 1,000-GALLON UST
C. 2,000-GALLON UST

AOC-4
ROOF VENTS,
MISCELLANEOUS LOCATIONS ACROSS THE SITE.
ENCOMPASSING ENTIRE FOOTPRINT OF ROOF.

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WATERS TECHNOLOGIES CORP. (MILLIPORE)
TECHNOLOGY DRIVE MILFORD, MA

Mabbett & Associates
Environmental Consultants & Engineers

- \= ERN M

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FIGURE 4

Aerial Map for the Waters Corporation Facility

WATERS TECHNOLOGIES CORP. (MILLIPORE)

5 TECHNOLOGY DRIVE MILFORD, MA

NO.	DATE	DESCRIPTION	DRN	CHK	APP
		REVISION			

Mabbett & Associates
Environmental Consultants & Engineers

FACILITY LAYOUT FIGURE

DWG. NO. L-4

DRAWN DJA | APPROVED JRG | SCALE NOT TO SCALE | PROJ. NO. 7051012.001

S:\CADD\WORK\RCRA RFA\Waters\Waters Site Figure L-4 AOC_SWMU.dwg - 4_AOC_SWMU Site Plan - Jul. 18, 2011 8:54am - wp

ATTACHMENT 1

Waters Corporation
Solid Waste Management Unit (SWMU) and
Areas of Concern (AOC) List

Waters Corporation

Solid Waste Management Unit (SWMU) and Areas of Concern (AOC) List

SWMU

1. Loading Dock Area
   a. Drum Storage Area
   b. Roll off Containers
2. Solvent Storage Room
3. Waste Storage Room (5 Technology Drive)
4. Wastewater Pretreatment System
   a. Membrane Filtration
   b. Neutralization
   c. Batch Evaporation
5. Former Waste USTs (5A, 5B, 5C) and associated floor drains (5D)
6. Domestic Waste (including 1996 Hydraulic Oil release)

AOC

1. Heating Oil USTs
2. Emergency Generator USTs/AST (2A, 2B, 2C)
3. Former USTs (3A, 3B, 3C)
4. Roof Vents

ATTACHMENT 2

Photographic Log

Photo 1: Parts Washer, main manufacturing area

Photo 2: Machined Metal and Oil, main manufacturing area

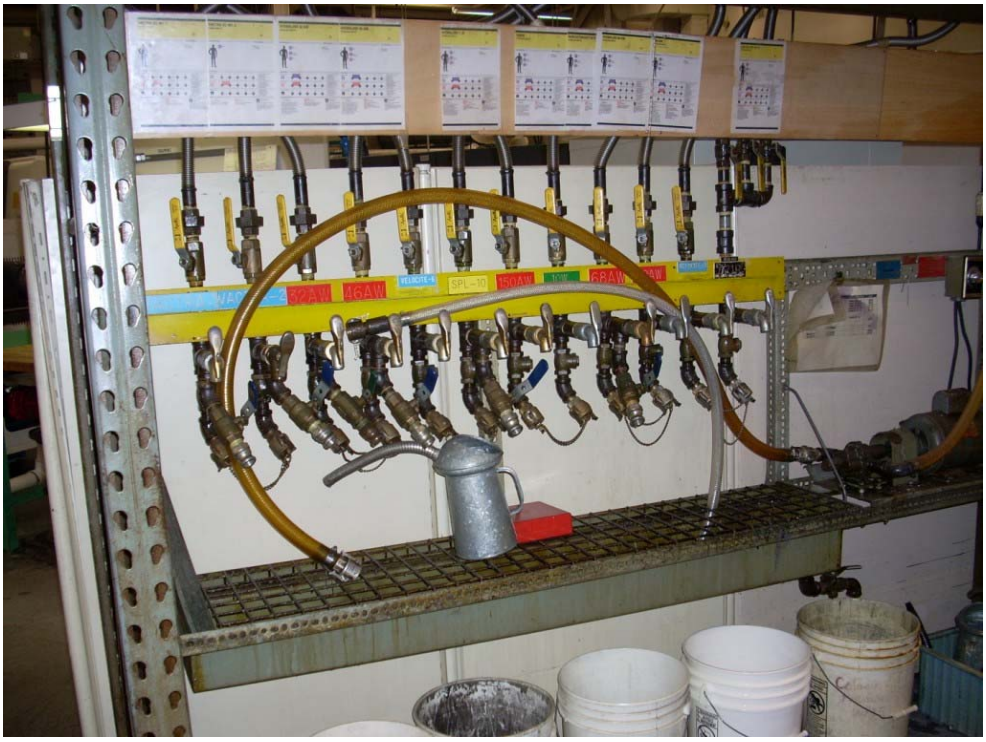

Photo 3: Virgin Oil Dispensing for Machining Operations, main manufacturing area

Photo 4: Drums leading to Photo 3, main manufacturing area

Photo 5: Satellite Oil Storage Area ~ Waste Drum, main manufacturing area

Photo 6: Continuation of above ~ Virgin Drums, main manufacturing area

Photo 7: Capped Floor Drain, main manufacturing area

Photo 8: Stormwater Retention Basin, facing I-495

Photo 9: Hazardous Waste Drum storage, inside SWMU-2

Photo 10: Caustic Drum Storage, SWMU-1

Photo 11: Locked entrance to SWMU-2

Photo 12: Empty drum storage, adjacent to SWMU-1 and SWMU-2

Photo 13: Acid Drum Storage, SWMU-1

Photo 14: Spill containment, SWMU-1

Photo 15: Waste storage drums and roll off bins, SWMU-1

Photo 16: Locked entrance to SWMU-3

Photo 17: UST for Emergency Generator, AOC-2

Photo 18: Emergency Generator, AOC-2

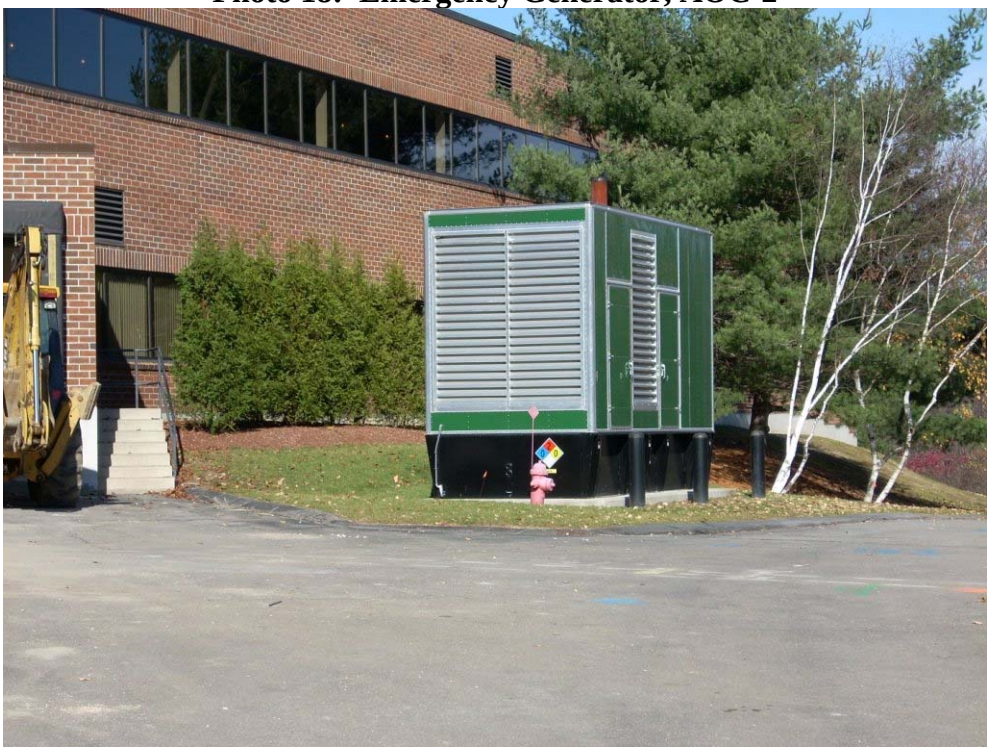

Photo 19: AST for Emergency Generator, AOC-2

Photo 20: USTs for heating oil, AOC-1

Photo 21: Solid Waste Dumpster, Site of Lube oil release, SWMU-6

Photo 22: Storm Water Catch Basin, with oil liner, SWMU-6

Photo 23: Storm Water Catch Basin, north of the facility

Photo 24: UST for Emergency Generator, AOC-2