FINAL
RCRA INVESTIGATION (RFI)
WORKPLAN

Former Norton/Nashua Tape Products Facility
2600 Seventh Avenue
Watervliet, New York
EPA ID No. NYD 066829599
NYSDEC Index Number: CO 4-20001205-3375

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SECTION 1.0

INTRODUCTION

This workplan has been prepared to summarize data collection activities associated with a RCRA Facility Investigation (RFI) at the former Norton Company (Norton)/Nashua Tape Products (Nashua) manufacturing facility located at 2600 Seventh Avenue, Watervliet, New York (see Site Location Map, Figure 1-1). A Site Layout Map is provided as Figure 1-2.

The RFI Workplan was originally submitted to the New York State Department of Environmental Conservation (NYSDEC) on September 5, 2002; NYSDEC provided comments on October 28, 2002. The general scope of work was discussed and agreed upon at a meeting between representatives of Saint-Gobain Corporation (Saint-Gobain) and the NYSDEC on November 21, 2002 (and during follow-up correspondence), and a revised Workplan was submitted on December 20, 2002. This Workplan incorporates additional comments provided by NYSDEC during telephone conference calls on February 19, April 23 & June 26, 2003.

The principal objectives of the RFI are to: 1) further define the spatial distribution and magnitude of residual subsurface impact associated with the four solid waste management units (SWMUs) identified in the June 4, 2002 NYSDEC Order on Consent Index No. CO: 4-20001205-3375 and eight other areas of concern (AOCs) identified at the Site (as described in Section 2.0 of this Workplan); and 2) assess the necessity and scope of future corrective actions, if any, subject to NYSDEC's prior approval.

Proposed RFI data collection activities include: 1) installation of Geoprobe borings, and collection of soil and ground-water samples; 2) completion of select Geoprobe borings as small-diameter ground-water monitoring points; 3) installation of conventional monitoring wells; 4) collection of liquid-level data from all conventional monitoring wells and small-diameter ground-water monitoring points; 5) collection of hydraulic conductivity data; 6) quarterly ground-water quality sampling at new and selected existing wells; 7) collection of vapor samples from selected monitoring wells installed in sewer bedding materials; 8) periodic sanitary/storm sewer water and sediment sampling and periodic monitoring at key locations; and 9) a preliminary assessment of potential corrective actions and any prerequisite feasibility testing, subject to NYSDEC's prior review and approval.

The RFI will be conducted in an iterative manner. Phase I will consist of the delineation of potential residual sources in the SWMUs and AOCs via installation of Geoprobe (and/or hand auger) borings and monitoring points (smaller diameter wells) as described in Section 3.0. A second round of Geoprobe borings will be installed, if necessary, to complete delineation sampling. Phase II will consist of the installation of permanent monitoring wells as outlined in Section 4.0, and Phases III & IV will focus on the establishment of temporal concentration trends in areas confirmed as residual sources during the delineation phase (as summarized in Sections 5.0 & 6.0 for monitoring well and sewer water sampling, respectively). Phase V will evaluate the necessity and type of potential remedial actions (see Section 7.0), if any, subject to NYSDEC review and approval.

Quality Assurance/Quality Control (QA/QC) for all activities will be conducted in accordance with the procedures outlined in Sections 8.0, 9.0 & 10.0. If specific QA/QC procedures are not presented in this work plan, the procedures specified in the April 1994 Quality Assurance Project Plan (QAPP), IRM and General RFA/RFI Sampling Investigation work plan prepared by Rust Environment & Infrastructure (Rust) will be followed. This document will take precedence in case of conflicting statements. A QAPP contact table was included as Attachment B of the September 2001 RCRA Facility Assessment (Enhanced RFA) Workplan.

All field work will be performed in compliance with applicable OSHA regulations and the site-specific master Health and Safety Plan (HASP) previously provided as Attachment B of the September 2001 RCRA Facility Assessment (Enhanced RFA) Workplan. Subcontractors will be required to develop their own site-specific HASPs that, at a minimum, comply with conditions/protocol identified in the master HASP.

Following receipt of the analytical data from all phases of the RFI, Saint-Gobain will prepare a report summarizing the results of the RFI for submittal to the NYSDEC as discussed in Section 11.0. If warranted, a meeting between Saint-Gobain and the NYSDEC will be scheduled to discuss the results of the RFI, and review the necessity and scope of further response actions (investigative and/or corrective measures), if any, for the Site.

SECTION 2.0

AREAS OF INVESTIGATION (SWMUs & AOCs)

Based on the data summarized in the May 2002 RCRA Facility Assessment (Enhanced RFA) Sampling Results Report, previous investigations performed at the Site (prior soil, ground-water, and sewer sampling results at the Site are summarized in figures accompanying the April 1996 Summary of Existing Environmental Contamination Report by Rust - see Section 12.0 for a list of references), and additional meetings and discussions with the NYSDEC, four SWMUs and eight AOCs have been identified at the Site. Each of these areas, depicted on Figure 2-1, is briefly discussed below:

- <u>Former Tank Farm SWMU</u> – Previous investigations in the area surrounding the former tank farm north of Building #61 detected elevated concentrations of toluene and heptane in soil and ground water. Impact in this area was previously presumed to be associated with a leak(s) in the "solvent" lines (see Figure 2-1) that were taken out of service by Norton in 1969.

- <u>Storm Sewer & Sanitary Sewer SWMUs</u> - Elevated photoionization detector (PID) readings were historically obtained in storm sewer manholes during prior investigations. Elevated concentrations of volatile and semi-volatile organic compounds were detected in several water and sediment samples collected from sewer manholes during the December 1989 investigation, and in several sediment samples collected from sewer manholes during the Enhanced RFA sampling event (October 2001). Additional details on previous sampling results and proposed activities are provided in Section 6.0.

- <u>Former "Beartex' Sump Pit SWMU</u> – This sump pit, closed in or about 1990, received liquids containing volatile organic compounds (VOCs) during the period of Norton "Beartex" operations. Previous reports indicate that VOCs were also detected in the sanitary sewer formerly connected to the sump. Although soil samples historically collected outside the building to the north of the former sump contained minimal concentrations of toluene, a complete assessment has not been performed in the vicinity of the sump inside of the building.

- <u>Former Solvent Line AOC</u> – Subsurface product lines were historically used to transport tolusol (toluene and heptane) and toluene between the tank farm and stub-ups in the northern portion of Building #58. Although previous investigations presumed that a line leak was located near the tank farm, it is also possible that there were leaks along the subsurface lines in Buildings #58 & #61.

- Former Test Pit AOC – Following the discovery of the original release in 1969, a test pit was installed in Building #61 (see Figure 2-1) to recover free-phase product (see Rust, 1996). A soil gas sample collected in the vicinity of the test pit (see figure provided in Rust, 1996) detected minimal residual contamination in this area; however, soil gas survey results were not confirmed by laboratory analysis.

- Building #58 AOC – Soil samples historically collected from geotechnical test borings installed in this building indicated the presence of toluene, heptane, and fuel oil at elevated concentrations. According to the April 1996 Rust Report, a possible source for the fuel oil was the Troy Malleable Iron Works, which operated at the Site prior to the 1940s. Currently, there are two large cutouts in the concrete floor of the building, which are believed to be associated with footings for two pieces of heavy machinery used during former Nashua operations at the Site.

- Solvent Recovery Room (adjacent to Building #59) AOC – According to previous reports (see TRC, 1993), this room was used during Norton and Nashua operations to recover toluene from the process air stream prior to its discharge to the atmosphere. A previous soil boring in this area (TB-3) detected low levels of toluene and creosols (2-methylphenol and 4-methylphenol). The April 1996 Rust Report speculated that the source for the creosols may be coal and cinders that were used as fill at the Site.

- Building #61 Doorway Spill AOC – According to previous reports, a small area of asphalt near the doorway of Building #61 was damaged by a toluene spill in 1989, and methyl iso-butyl ketone (MIBK) was detected in soil samples collected from this area (see Rust, 1996).

- Filter Room (adjacent to Building #59) AOC – Process liquids were historically filtered in this room. No soil samples were collected from this area during previous site investigations.

- Quonset Hut C (adjacent to Buildings #59 & #60) AOC – A drum leaking epoxy-like material was observed in Quonset Hut C at the time of the Enhanced RFA sampling event (October 2001). The drum was not present during a subsequent site visit in July 2002; however, small spills of the epoxy-like material and black stains were noted on the floor of Quonset Hut C and in the area between Quonset Huts C & D. It is possible these spills or associated surface run-off may have entered the storm sewer system. (It should be noted that this AOC has no relation to any Norton operations at any point in time.)

- Quonset Hut B (adjacent to Building #61) AOC – Quonset Hut B has an asphalt floor. Inside the hut, a bermed area of approximately 20 feet by 20 feet was reportedly used to store 55-gallon drums of waste toluene and adhesive. According to the 1993 TRC Report, this "hazardous waste management unit" was closed by Nashua in 1988; however, no soil samples were collected from beneath the asphalt.

SECTION 3.0

PHASE I - GEOPROBE BORINGS AND MONITORING POINTS

Geoprobe borings will be conducted to: 1) qualitatively/semi-quantitatively evaluate (screen) areas of potential residual impact; and 2) collect samples for the quantitative (i.e., laboratory) assessment of the presence/absence and extent of residual soil and/or ground-water contamination. For field screening purposes during the current investigation, PID readings exceeding 100 parts per million by volume (ppmv), or the presence of a sheen in the jar/water test (Building #58 AOC), will be considered evidence of residual soil impact, and necessitate lateral expansion of the geoprobe array in accordance with the decision matrix set forth in Table 3-1. Field screening methods are discussed in Section 3.2.

If residual soil impact (as defined above) is detected in a given Geoprobe boring, additional borings, as appropriate, will be installed at 20-foot intervals in the same direction (and then laterally as necessary) until the areal extent of residual impact is defined based on the above-noted field screening criteria. If confirmatory laboratory data from an individual outermost/delimiting Geoprobe boring location indicate that soil quality data exceeds applicable NYSDEC recommended soil cleanup objectives (as identified in Technical and Administrative Guidance Memorandum [TAGM] #4046, dated January 24, 1994), additional Geoprobe borings will be installed during subsequent mobilizations to complete spatial delineation to the applicable soil cleanup objective via laboratory analysis of soil samples.

If a comparison between initial laboratory data and field PID readings(s) indicates that the designated 100 ppmv PID field screening criterion is not conservative enough for delineation purposes, the PID field screening criterion may be decreased after discussion with the NYSDEC Site Engineer. Conversely, if a comparison between initial laboratory data and field PID readings(s) indicates that the designated 100 ppmv PID field screening criterion is resulting in the installation of redundant/excessive Geoprobe borings, the PID field screening criterion may be increased after discussion and approval by the NYSDEC Site Engineer.

Except as noted in Section 3.2, a minimum of one soil sample will be collected from each Geoprobe boring for laboratory analysis. If residual impact as defined above is detected during field screening in a specific SWMU/AOC, the Geoprobe will be utilized to collect a water sample (see Section 3.3). Proposed Geoprobe field work is summarized in Table 3-2.

3.1 Proposed Geoprobe Boring Locations

Geoprobe borings and/or wells are proposed in each of the identified SWMUs and AOCs (see Figure 2-1) as discussed below. Proposed Geoprobe boring locations are depicted on Figure 3-1.

- Former Tank Farm SWMU – A minimum of six borings will be installed to define the extent of residual impact to soils and/or ground water (see Figure 3-1). Several of these borings will be completed as ground-water monitoring points (see Section 3.6) and may be of assistance if feasibility testing is required for remedial technologies in this area.

  Two borings will be installed immediately south of the former tank farm containment area, and one boring will be installed immediately east and west, respectively, of the former containment area (see Figure 3-1). If, as noted above, evidence of residual soil impact (i.e., PID readings exceeding 100 ppmv) is detected, additional borings will be installed at 20-foot intervals in the direction(s) exhibiting residual impact (south, east, or west) until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data. Because there is adequate ground-water monitoring coverage in this area (existing monitoring wells DGC-5 & DGC-7, and a proposed conventional monitoring well to the south – see Figure 4-1), rather than collect a ground-water sample from the boring with the highest PID reading, the Geoprobe will be utilized to collect a water sample from the boring location farthest downgradient (north or east) of existing monitoring well DGC-5.

  The area north of the tank farm is an active railroad right-of-way. Based on previous experience at other sites, it can be difficult to obtain access to the right-of-way in these situations, and it is anticipated that securing access, if possible, will likely be a prolonged process. If access is obtained, three borings will be installed in the right-of-way to the north of the former tank farm as indicated on Figure 3-1.

If evidence of residual soil impact (PID readings exceeding 100 ppmv unrelated to an alternate source associated with the railroad) is detected in any of these three borings additional Geoprobe borings will be installed at approximately 20-foot intervals in the direction(s) exhibiting residual impact (northwest, north, or northeast) until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data, if possible. The Geoprobe will be utilized to collect a water sample from the boring with the highest PID reading (or if none, the boring farthest downgradient from the Former Tank Farm). Because future access to the right-of-way for drilling rigs may be restricted, following discussions with the NYSDEC Site Engineer, one or more borings in the right-of-way may be selected for immediate completion as small-diameter ground-water monitoring points (see Section 3.6).

If access to the right-of-way cannot be obtained in a timely manner, two contingent Geoprobe borings will be installed immediately north of the former tank farm, one boring east and west of DGC-8, respectively (see Figure 3-1). The Geoprobe will be utilized to collect a water sample from each boring.

- Storm Sewer & Sanitary Sewer SWMUs – Storm and sanitary sewer bedding wells will be installed at two outdoor downgradient locations (see Figure 4-1): MH-5 & MH-1(San), and one indoor storm sewer manhole location: MH-12. Initial outdoor drilling will be via "air-knife" drilling techniques; however, a Geoprobe rig will be used to complete these three wells as necessary (see Section 6.4).

- Former "Beartex' Sump Pit SWMU – A minimum of four borings will be installed, one adjacent to each side of the former sump pit (see Figure 3-1). If there is adequate space for rig access, the boring on the north side of the sump pit will be installed between the former sump and the building wall; otherwise, the boring will be installed immediately outside the building. If evidence of residual soil impact (PID readings exceeding 100 ppmv) is detected during boring installation, the Geoprobe will be used to collect a ground-water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings will be installed in the same direction(s) at 20-foot intervals from the former sump until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data.

- Former Solvent Line AOC – A minimum of ten Geoprobe borings will be installed in Building #61 along the abandoned solvent lines that run between the tank farm and the stub-ups in the northern portion of Building #58 (see Figure 2-1). Initial borings will be installed to the east and west of the solvent lines on either side of the storm sewer running east-west beneath Building #61, and then proceed north and south along the eastern side of the abandoned solvent lines at a spacing of 20 feet (see Figure 3-1). If evidence of residual soil impact (PID readings exceeding 100 ppmv) is detected during boring installation, the Geoprobe will be used to collect a ground-water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings will be installed in the same direction(s) at 20-foot intervals from the abandoned solvent lines until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data.

- Former Test Pit AOC – A minimum of five Geoprobe borings will be installed in the presumed location of the former test pit in Building #61 (see Figure 3-1). If evidence of residual soil impact (PID readings exceeding 100 ppmv) is detected during boring installation, the Geoprobe will be used to collect a ground-water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings will be installed in the same direction(s) at 20-foot intervals from the former test pit until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data.

- Building #58 AOC – A minimum of ten Geoprobe borings will be installed to assess the two floor cutouts in Building #58 (see Figure 3-1). (Note: prior to boring installation, any standing water in the cutout will be pumped into 55-gallon drums and treated in the similar manner as described for purge water in Section 5.6.) If evidence of residual soil impact (PID readings exceeding 100 ppmv and/or a visible sheen in the jar/water test – see Section 3.2) is detected during boring installation in the vicinity of a given floor cutout, the Geoprobe will be utilized to collect a water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings, as appropriate, will be installed in the same direction(s) at 20-foot intervals from the cutout until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data.

- Solvent Recovery Room (adjacent to Building #59) AOC – Access permitting, a minimum of two shallow borings will be installed inside the building (see Figure 3-1). If evidence of residual soil impact (PID readings exceeding 100 ppmv) is detected during boring installation, the Geoprobe will be utilized to collect a water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings will be installed in the same direction(s) at 20-foot intervals from the building until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data. If the Geoprobe rig cannot access this building, three shallow hand borings installed to a depth of approximately one foot below the subbase gravel will be substituted (a water sample will not be collected).

- Building #61 Doorway Spill AOC – A minimum of one boring will be installed in the area adjacent to the doorway. If evidence of residual soil impact (PID readings exceeding 100 ppmv) is detected during boring installation, the Geoprobe will be utilized to collect a water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings will be installed at 20-foot intervals from the exterior wall of the building until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data.

- Filter Room (adjacent to Building #59) AOC – A minimum of two borings will be installed in the asphalt area outside the east and north walls of the filter room (see Figure 3-1). If evidence of residual soil impact (PID readings exceeding 100 ppmv) is detected during boring installation, the Geoprobe will be utilized to collect a water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings will be installed in the same direction(s) at 20-foot intervals from the building until the areal extent of residual soil impact is defined through field screening and confirmatory laboratory data.

- Quonset Hut C AOC – Two borings will be installed; one in the asphalt area between Quonset Huts C & D, and one inside Quonset Hut C (see Figure 3-1). The Geoprobe will be utilized to collect a water sample from the boring exhibiting the highest degree of residual soil impact (or if no residual soil impact is detected, inside Quonset Hut C, which historically housed a leaking drum).

- Quonset Hut B AOC – Access permitting, three borings will be installed inside the building (see Figure 3-1). If evidence of residual soil impact (PID readings exceeding 100 ppmv) is detected during boring installation, the Geoprobe will be utilized to collect a water sample from the boring exhibiting the highest degree of residual soil impact, and additional borings will be installed in the same direction(s) at 20-foot intervals from the building to define the areal extent of residual soil impact through field screening and confirmatory laboratory data. If the Geoprobe rig cannot access this building, three shallow hand borings installed to a depth of approximately one foot below the subbase gravel will be substituted (a water sample will not be collected).

3.2 Geoprobe Boring Installation and Field Screening Methods

Continuous soil samples will be obtained via Geoprobe recovery "sleeves" (i.e., disposable four-foot acetate liners placed in the macro-core sampler). Each liner sleeve will be extracted by the Geoprobe, opened with a liner or utility knife, and screened with a PID to select the portion of the recovered soil sample that will immediately be placed in appropriate bottleware for possible laboratory analysis. Samples collected for VOC analysis will be packed to minimize headspace in the container (refer to Table 3-3 for other details). A small sample (approximately 100 grams) of the remaining soil exhibiting the highest PID reading in the Geoprobe liner will be placed in a sealable plastic bag, shaken for 15-30 seconds, and allowed to equilibrate to ambient temperature for several minutes before piercing the bag to obtain a PID reading (MiniRae2000 [or equivalent], calibrated twice-daily or after any two hour break, equipped with a 11.6 eV lamp).

Because there is the potential for residual fuel oil contamination in the Building #58 AOC, in addition to PID screening, soils from this area of investigation will be screened using a qualitative jar/water test. A small sample of the most stained soil (or alternatively the highest remaining PID reading) from the Geoprobe liner (approximately 25 grams) will be placed in a four ounce glass jar (or other standard size), filled halfway with water, agitated for approximately 15 seconds, and examined for the presence of a petroleum sheen.

In accordance with the decision matrix set forth in Table 3-4, a minimum of one soil sample from each Geoprobe boring will be submitted for laboratory analysis (see Section 3.3). The soil sample interval submitted for laboratory analysis from each boring will be selected according to the following order of priority: 1) the soil interval with the highest PID reading; 2) in the Building #58 AOC - the soil interval exhibiting a sheen in the jar/water test; 3) the most highly stained soil interval; or, if there is no evidence of residual impact, 4) the soil interval collected immediately above the water table. A second soil sample will be submitted for laboratory analysis from a Geoprobe boring if there is a bimodal vertical distribution of residual soil impact within the boring (i.e., impacted intervals are separated by at least four feet).

In the event that the proposed number of borings in an area of investigation is expanded to delineate the spatial distribution of residual impact, Saint-Gobain may choose not to run soil samples for laboratory analysis from Geoprobe boring locations that are not serving as outermost/delimiting locations (i.e., these boring locations are not required to define the areal extent of residual soil impact via confirmatory laboratory data). However, Saint-Gobain will collect additional soil samples for laboratory analysis during a subsequent mobilization if it is later determined that select locations in such areas are essential for remedial design evaluation.

After field screening to collect soil samples for laboratory analysis, remaining soil in the recovered Geoprobe liner will be used for field descriptions. Soil sample field descriptions will include assessment via Unified Soil Classification System (USCS) for 1) composition, 2) consistency and density, 3) color, 4) moisture content, 5) grain size/sorting, and 6) presence/absence of staining, discoloration, and odors.

Geoprobe borings will be advanced to the water table (approximate depth 5 to 12 feet), or approximately four feet below the water table if it has been determined that a ground-water sample will also be collected (see Section 3.4). In addition, one Geoprobe boring in each of following the areas: the Former Tank Farm SWMU, the Building #58 AOC, and the Quonset Hut B AOC, will be extended into the water table for the collection of a soil sample for total organic carbon (TOC) laboratory analysis (see Section 3.5).

Geoprobe bore holes that are not converted to ground-water monitoring points (see Section 3.6) will be abandoned by backfilling with any remaining soil cuttings followed by hydrated bentonite chips. The surface will be restored with cold patch or concrete as applicable. Any excess soil cuttings will be temporarily stored in 55-gallon drums prior to characterization and proper disposal.

At the completion of each bore hole (and prior to leaving the site), all equipment that has been exposed to site soils or ground water will be decontaminated utilizing an Alconox wash and tap water rinse. The handling and disposal of liquids generated during the decontamination process is discussed in Section 9.0.

3.3 Geoprobe Soil Sample Analyses

Soil samples will be collected in appropriate laboratory bottleware (see Table 3-3), properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt. Soil samples will be analyzed for VOCs via EPA Method 8260 plus heptane and tentatively identified compounds (TICs), and semi-volatile organic compounds (SVOCs) plus TICs by EPA Method 8270. As indicated in Table 3-3, soil samples for VOC analysis will be collected to minimize headspace. One soil sample collected from the water table at the Former Tank Farm SWMU, the Building #58 AOC, and the Quonset Hut C AOC will be analyzed for TOC via EPA Method 415.1. All soil analyses will include Category B laboratory deliverables.

3.4 Geoprobe Ground-Water Sampling

At selected Geoprobe boring locations identified in Section 3.1, ground-water samples will be collected utilizing the Geoprobe Screen Point sampler equipped with a four-foot screen length (or similar device). A decision matrix for the collection and submittal of Geoprobe ground-water samples for laboratory analysis is presented as Table 3-5.

The Geoprobe ground-water sampler will be installed across the water table and the rods retracted to expose the screened interval, allowing ground water to enter the sampler. A peristaltic pump will be used to purge the boring of bulk sediments and reduce turbidity. Ground-water samples will be collected after the stabilization of temperature, conductivity, and pH in the purge water. If the boring goes dry during the purging, ground-water samples will be collected following the recharge of sufficient ground water for sampling. The handling and disposal of purge water is discussed in Section 5.6.

3.5 Geoprobe Ground-Water Sample Analyses

Ground-water samples will be collected in appropriate laboratory bottleware (see Table 3-3), properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt via courier or overnight delivery. Ground-water samples will be analyzed for VOCs via EPA Method 8260 plus heptane and TICs, and SVOCs plus TICs by EPA Method 8270. A summary of relevant sampling protocol have been provided in Table 3-3. All analyses will include Category B laboratory deliverables.

3.6 Installation of Small-Diameter Ground-Water Monitoring Points

The four initial Geoprobe borings installed in the vicinity of the former Tank farm SWMU, and selected contingent Geoprobe borings north of the tank farm (see Section 3.1), will be completed as fixed ground-water monitoring points for possible use during future feasibility testing, if required. Geoprobe borings in other areas will not be converted to ground-water monitoring points because there are existing or proposed/contingent monitoring wells (see Section 4.0) in the vicinity of these borings. (Note: If indoor access restrictions prevent the use of a standard drilling rig, the Geoprobe rig may be converted to install small diameter monitoring wells via hollow-stem auger [HSA] techniques inside the building.)

Ground-water monitoring points will be installed by extending the existing Geoprobe boring approximately ten feet below the level of the water table (or to refusal) to allow for seasonal ground-water fluctuations. Small-diameter ground-water monitoring points will be constructed of one-inch diameter, flush-threaded joint, Schedule 40 PVC riser and screen (fifteen feet 0.010-inch slot size), and bottom plug. The annulus of each monitoring point will be filled with a #1 or #2 sand pack extending a minimum of one foot above the screened interval, sealed with approximately one to two feet of bentonite, and then grouted to the surface. Alternatively, Geoprobe "pre-pack" well and filter kits may be used to complete these monitoring points.

Each ground-water monitoring point will be completed with a bolt-down, flush-mounted vault anchored by a concrete skirt, and equipped with a locking gripper-plug to prevent unauthorized access. Following installation, each ground-water monitoring point will be properly developed to remove fine-grained sediments from the sand pack and screen, and surveyed to existing site benchmark elevations. Well development water will be staged and processed in a similar manner as ground-water sampling purge water (described in Section 5.6).

SECTION 4.0

PHASE II - MONITORING WELL INSTALLATION

4.1 Proposed Monitoring Well Locations

Based on ground-water analytical results obtained during the Phase I Geoprobe boring program (see Section 3.0), a minimum of seven monitoring wells (and 11 contingent monitoring wells) are proposed to further assess the extent and potential transport of residual ground-water contamination at the Site (see the decision matrix set forth in Table 4-1). Contingent wells may be installed in a specific SWMU/AOC, as discussed below, if ground-water quality data from the prior Geoprobe sampling exceeded applicable NYSDEC Standards/Guidance Values (see Technical and Operational Guidance Series [TOGS] 1.1.1, revision dated June 1998 and additions). Proposed and contingent monitoring wells in each SWMU/AOC are as follows (see Figure 4-1 for proposed well locations and Table 3-1 for a summary of the proposed work):

- Former Tank Farm SWMU – One monitoring well is proposed for the area south of the tank farm containment area, existing monitoring wells are present east (DGC-5) and west (DGC-7) of the containment area; and four soil borings adjacent to the tank farm will be completed as permanent small-diameter monitoring points (see Section 3.6). As noted in Section 3.1, if access is obtained to the railroad right-of-way, following the collection and assessment of field data, and discussions with the NYSDEC Site Engineer, one or more borings may be completed as monitoring wells (or small-diameter points) to allow future ground-water monitoring in this area. If access to the railroad right-of-way is not obtained, the utility and appropriateness of installing one to two monitoring wells north of the railroad right-of-way (i.e., south of Alden Street) will be discussed with the NYSDEC Site Engineer.

- Storm Sewer & Sanitary Sewer SWMUs – Monitoring wells installed in the sewer bedding are proposed for the storm sewer system near MH-5 & MH-12 (access permitting), and for the sanitary sewer system near MH-1(San). At outdoor locations, initial drilling will be via air-knife techniques; however, a Geoprobe rig may be used to complete these wells as necessary. Additional information on these wells is provided in Section 6.4.

- Former "Beartex' Sump Pit SWMU and Building #61 Doorway Spill AOC – If indicated by ground-water laboratory analytical data, contingent wells will be installed just outside the building between storm sewer manholes MH-1 & MH-2 and approximately 35 feet to the northeast (see Figure 4-1).

- Former Solvent Line AOC – If indicated by ground-water laboratory analytical data, contingent well(s) will be installed in this indoor area after reviewing the data with the NYSDEC Site Engineer.

- Former Test Pit AOC – If indicated by ground-water laboratory analytical data, a contingent well will be installed in this indoor area.

- Building #58 AOC – Two monitoring wells will be installed downgradient from this AOC; one between the northernmost floor cutout and the sanitary sewer, and one in Building #59 between the floor cutouts and the sanitary sewers (see Figure 4-1). If indicated by ground-water laboratory analytical data, a contingent third monitoring well may be installed near the southernmost floor cutout.

  As discussed in Section 4.6, if access restrictions inside the building prevent the use of a standard drilling rig in the three indoor AOCs discussed above, a Geoprobe rig will be used. Wells installed with the Geoprobe rig may be completed as two-inch (versus four-inch) diameter monitoring wells.

- Solvent Recovery Room & Filter Room (adjacent to Building #59) AOCs – One monitoring well is proposed near manhole MH-6 (see Figure 4-1) irrespective of ground-water data in this area to replaced DGC-3 (destroyed). However, if indicated by ground-water data laboratory analytical data, one or two monitoring wells will be installed immediately downgradient (northeast) from the area(s) of residual soil impact.

- Quonset Hut C AOC – Based on Geoprobe ground-water sample laboratory results, a contingent monitoring well may be installed in this area.

- Quonset Hut B AOC – If indicated by ground-water laboratory analytical data, a contingent well will be installed east of the building.

4.2 Monitoring Well Installation

Monitoring wells will be installed via standard hollow-stem auger (HSA) methods to bedrock refusal (approximately 15 to 25 feet). If more than 15 feet of saturated overburden is encountered at any proposed monitoring well location, the alternative of installing a shallow/deep "nested" monitoring well pair will be discussed with the NYSDEC Case Engineer. Stainless steel split-spoons will be advanced through the augers at five-foot intervals and hammer blow counts recorded. Each split-spoon will be extracted, opened, and immediately field-screened with a PID, and soil sample descriptions recorded, as discussed in Section 4.2.

Because proposed monitoring well locations are based on data obtained from the Phase I boring investigation (see Section 3.0), it is not anticipated that any soil samples will be collected for laboratory analysis during monitoring well installation. However, if indicated (e.g., field conditions, elevated PID reading [vs. PID reading obtained during boring installation], gap in analytical soil data, etc.), contingent soil samples may be collected from select well borings and submitted for laboratory analysis as discussed in Section 3.3. Drill cuttings will be temporarily stored in 55-gallon drums prior to characterization and proper disposal.

Proposed monitoring wells in areas with restricted access (indoor locations and sewer bedding wells) may be installed via a Geoprobe rig converted to advance hollow-stem augers. Split-spoons will not be advanced at these locations (and soil samples will not be collected if a former Geoprobe soil boring is converted to a monitoring well). Wells installed via Geoprobe will be completed as outlined below, but substituting 2-inch (versus 4-inch) diameter PVC well materials, or alternatively, Geoprobe "pre-pack" well and filter pack kits may be used.

Proposed monitoring wells will be constructed of approximately 10 feet of Schedule 40 4-inch diameter PVC well screen (0.010 inch slot) installed across the water table (approximate depth 10 feet) to allow for any seasonal fluctuations, and completed with solid Schedule 40 4-inch diameter PVC well riser to the surface. Clean silica sand (#1 or #2) will be used to fill the well annulus to at least one foot above the top of the screened interval. A one to two-foot thick bentonite seal will be installed above the gravel pack to prevent surface infiltration, and the remaining well annulus will be grouted to surface.

Each wellhead will be finished with a bolt-down, flush-mount vault secured by a 2-foot by 2-foot concrete skirt (smaller concrete skirts will be used inside the buildings). Each well will be equipped with a locking gripper-plug to prevent unauthorized access.

Subsequent to installation, the newly installed monitoring wells will be properly developed to remove fine particulate matter from the screened interval. Well development water will be staged and processed in a similar manner as ground-water sampling purge water (described in Section 5.6).

After the completion of each bore hole (and prior to leaving the site), all equipment that has been exposed to site soils or ground water will be decontaminated utilizing an Alconox wash and tap water rinse. The handling and disposal of liquids generated during the decontamination process is discussed in Section 9.0.

4.3 Monitoring Well Survey

The newly installed monitoring wells will be surveyed to establish horizontal position and vertical elevation. The survey will include newly installed small-diameter monitoring points (see Section 3.6), all existing monitoring wells, and select sewer manhole locations. Survey information will be used to prepare revised site base maps depicting monitoring locations, ground-water flow maps, isoconcentration maps, and other figures that will be included in the RFI Final and Summary Report (see Section 11.0).

4.4 Monitoring Well Sampling

Ground-water samples will be collected from each newly installed monitoring well a minimum of two weeks after development. Ground-water samples will be collected as part of the comprehensive event discussed in Section 5.2.

SECTION 5.0

PHASE III – GROUND-WATER SAMPLING & HYDRAULIC CONDUCTIVITY TESTING

5.1 Liquid-Level Data Collection

Prior to ground-water sampling, a synoptic round of liquid-level data will be obtained from the nine existing monitoring wells (see Figure 2-1), and all newly installed small-diameter monitoring points (see Section 3.6) and conventional monitoring wells (see Section 4.0). Immediately after each well cap is removed, a PID will be used to measure VOC vapor concentrations in the well.

Liquid-level data will be collected using an interface probe capable of detecting free-phase product. The total depth of the well will be determined by lowering the probe to the bottom of the well and recording the depth.

The interface probe will be decontaminated after use at each well by the methods outlined in Section 9.0. To reduce the potential for cross-contamination, existing monitoring wells with previous analyte detections (DGC-7 & DGC-8), and newly installed wells that demonstrated evidence of soil impact (via soil field-screening PID readings or laboratory analysis), will be gauged last.

5.2 Ground-Water Sampling

To establish temporal trends, ground-water samples will be collected from five existing monitoring wells (DGC-6 through DGC-10) and all newly installed monitoring wells at the Site on a quarterly basis for a minimum of four sampling events (one year). The four existing monitoring wells that have consistently demonstrated the absence of detectable VOCs (DGC-1, DGC-2, DGC-4 & DGC-5), will be sampled during the first event only; however, if target compounds are present above analytical method detection limits in any of these four wells during the initial event, that well will be incorporated into the quarterly sampling program. Data from the Summer & Fall 2003 sampling events will be included in the RFI Summary Report.

Monitoring wells will be sampled via the micropurge sampling method used during the 2001 "Enhanced RFA" sampling event. The United States Environmental Protection Agency (USEPA) has encouraged the use of this method because of its reproducibility, accuracy, and cost-effectiveness (additional details are available in the April 1996 USEPA reference document). A micropurging pump capable of a flow rate of approximately 0.1 to 0.5 liters per minute (i.e., peristaltic/bladder pump) will be used to minimize turbulence in the well bore and hydraulic stress on the formation. The pump will be positioned in the middle of the saturated portion of the screened interval of the well. Water quality indicator parameters (temperature, pH, specific conductivity, oxidation-reduction potential [ORP], and dissolved oxygen [DO]) will be monitored during purging with a continuous "flow-through" cell device (YSI-600XL or equivalent). Readings will be taken every three to five minutes until the following stabilization rates are achieved: pH ± 0.1 standard units, specific conductivity ± 3%, ORP ± 10 mV, and DO ± 10%. After the water quality parameters have stabilized, ground-water samples will be collected directly from the pump effluent line using dedicated tubing and pump bladders at each well.

5.3 Ground-Water Analyses

Ground-water samples will be collected in appropriate laboratory bottleware (see Table 5-1), properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt via courier or overnight delivery. All monitoring well samples will be analyzed for VOCs via EPA Method 8260 plus heptane and TICs, and SVOCs plus TICs by EPA Method 8270. A summary of relevant sampling protocol has been provided in Table 5-1. All analyses will include Category B laboratory deliverables.

5.4 Supplemental Analyses

In addition to the analyses discussed in Section 5.3, monitoring wells DGC-8 & DGC-9 will be sampled for the following electron acceptor and other natural bioattenuation parameters during the first ground-water sampling event (see Table 5-1): redox, pH, and O_2 (via field instrumentation), Fe^{+2} (via field chemical analysis kit), Fe^{+3} (from total iron via EPA Method 7380), nitrate/nitrite (EPA Method 353.2), phosphate (EPA Method 365.1), sulfate (EPA Method 375.4) alkalinity (EPA Method 310.1), methane/ethane/ethene (Misc. GC Methods), hydrogen sulfide to determine H_2 (from pH and sulfide via EPA Method 376.1), and total heterotrophic bacteria and toluene-xylene (TX)-degrading bacteria microbial counts (via Standard Plate Count Methods). These analyses will be used to determine the extent of intrinsic bioremediation occurring at the Site and evaluate the appropriateness of enhanced bioremediation (i.e., the addition of oxygen and/or nutrients) as a future corrective measure.

5.5 Hydraulic Conductivity Testing

Hydraulic conductivity testing will be conducted following ground-water sampling at monitoring wells DGC-6 & DGC-10. Testing will be performed by placing a combination pressure transducer/data logger unit (In Situ-brand "Troll" or similar) near the bottom of each well, and inserting a drop tube from a surface-mounted pump a minimum of five feet below the standing water level. Following well equilibration (approximately 5 to 10 minutes), the data logger will be activated, and the static water level will be recorded manually and via pressure transducer.

The well will then be pumped at a flow rate of several gallons per minute (equivalent to "slug out"). Pumping will continue until maximum drawdown (a minimum of three feet) is achieved. Total pumping time and the volume of water extracted will be recorded. When pumping is stopped, the water elevation in the well will recover (equivalent to a "rising head" test) and data logging will continue on a logarithmic scale until the water level has recovered to within 95 percent of its original elevation or a total elapsed recovery time of 45 minutes, whichever occurs first. Data will be analyzed via the Bouwer and Rice Slug Test Method (1976 & 1989) to determine the hydraulic conductivity at each well.

Water removed during hydraulic conductivity testing will be temporarily containerized in 5-gallon buckets and/or a 55-gallon drum. Containerized purge water will be processed with other purge water as described in Section 5.6.

5.6 Purge Water Disposal

Purge water from monitoring well sampling will be temporarily containerized in 55-gallon drums, which will be stored at an approved staging location at the site, pending laboratory analysis of the ground-water samples. Based on the sampling results, the purge water (and development water) will be: 1) processed through a treatment vessel (bucket) filled with liquid-phase granular activated carbon (GAC) if contaminant concentrations in the ground-water samples do not exceed NYSDEC Standards/Guidance Values set forth in NYSDEC TOGS 1.1.1, and discharged to the surface in the vicinity of the well with the highest contaminant concentrations; or 2) shipped to a permitted disposal facility if contaminant levels in the ground-water samples are above concentrations in NYSDEC TOGS 1.1.1. Any GAC used for the treatment of contaminated purge or redevelopment water will be containerized and properly disposed.

SECTION 6.0

PHASE IV – STORM AND SANITARY SEWER MONITORING & ASSESSMENT

6.1 Previous Sewer Sampling Results

Ten sediment and seven water samples were collected from storm and sanitary sewer manholes and analyzed for VOCs as part of the 2001 Enhanced RFA sampling event (for more details, see the June 2002 RCRA Facility Assessment [Enhanced RFA] Sampling Results Report). Chlorobenzene was detected in five sediment samples (see Table 6-1) at concentrations ranging up to 54,000 micrograms per kilogram (µg/kg) in MH-FC(San) (see Figure 2-1 for sewer manhole locations). Benzene, toluene, ethylbenzene, and xylenes (BTEX) were also detected in MH-FC(San) (and toluene was detected in MH-2.5 at a "J-flagged" concentration of 4 µg/kg), but the toluene concentration was several orders of magnitude lower than in previous sampling events. Toluene and heptane were not detected in the 2001 sediment sample from manhole MH-6, which had previously demonstrated elevated VOC concentrations. Further, volatile analytes were below detection limits (BDL) in all seven sewer water samples (see Table 6-2).

Three sediment samples and seven water samples were collected from storm and sanitary sewer manholes, and analyzed for SVOCs as part of the 2001 Enhanced RFA sampling event. A total of 21 semi-volatile analytes were detected in the three sewer sediment samples, although seven SVOCs had "J-flagged" estimated concentrations of 1.0 mg/kg or less (see Table 6-3). Other than "J-flagged" values, semi-volatile detections in sewer water samples (see Table 6-4) were limited to two SVOCs in sanitary sewer sample MH-1(San): 4-methylphenol and bis-(2-ethylhexyl)phthalate), and one SVOC in an off-site storm sewer sample: 4-methylphenol; concentration 16 micrograms per liter (µg/L). Semi-volatile sewer sediment and water sampling results from 2001 were generally consistent with historical results.

6.2 2001 Sewer Sampling Data Evaluation

The 2001 sewer water sampling data indicate that, under present flow conditions, there is currently no significant off-site migration of volatiles in water via the sewer systems. Volatile analyte concentrations in downstream sewer water samples (MH-5 & MH-1[San]) were BDL. Except for chlorobenzene, VOC concentrations in sewer sediments have decreased from previous sampling events suggesting that the source of the previously detected VOCs in sewer sediment and water samples has been reduced or removed. Reduction of VOC concentrations in ground water at the Site is further demonstrated by the 2001 monitoring well sampling event, which indicated that ground-water impact was limited to DGC-7 & DGC-8 (see Table 6-5).

However, the 2001 sewer and monitoring well sampling events were performed during a period of extended drought conditions. It is possible that when the water table is at a higher elevation, volatile concentrations may increase when ground water encounters residual source mass in the vadose zone. It is also possible that under high water table conditions, ground water may enter the sewer lines (infiltration), eventually flowing off site.

The 2001 semi-volatile sewer water sampling data are similar to the volatile data, that is, under present flow conditions, there is currently no significant off-site migration of SVOCs in water via the sewer systems, and SVOC concentrations in downstream sewer water samples were near or below detection limits (except for two analytes in the sanitary sewer that would be treated via the municipal system). However, the 2001 semi-volatile sewer sediment sampling data are significantly different, demonstrating the continued detection of numerous semi-volatiles at elevated concentrations. Based on compound-specific water to carbon and soil to water partitioning coefficients, ideal solubility, and maximum hypothetical soil equilibrium partitioning, the observed SVOC sewer sediments concentrations are too high to be the result of impacted ground water infiltrating the sewer. Semi-volatile impact in the sewer sediments is the result of historic or ongoing introduction of impacted sediments to the sewers.

6.3 Sewer Remedial Action Evaluation

The storm and sanitary sewer systems have been identified as SWMUs because of historical data indicating impact to sewer water and sediment, and the potential for these systems (and the surrounding bedding; see Section 6.4) to act as preferred pathways for contaminant transport within the site and off site. As discussed in Section 6.2, presently, there is no evidence of significant impact to storm or sanitary sewer water at the Site, and current impact to sewer sediments is limited primarily to SVOCs, which will be addressed as outlined below. Therefore, the primary concern regarding the sewer systems is their potential as an off-site migration route.

Preventing VOC migration via the sewer systems is most effectively accomplished by determining the presence/absence and extent of residual VOC source mass in the subsurface (soils and ground water), evaluating the potential for migration to the sewer system, and identifying any necessary remedial actions, including contingent sewer repairs as discussed below. The other phases of this RFI Workplan are designed to address these objectives, and based upon these results, a Corrective Measure Evaluation (see Section 7.0), subject to NYSDEC approval, will assess the necessity, if any, to conduct a detailed study on the interaction between ground water and the sewer system (only practical when an elevated water table is present at the Site). In the interim, supplemental sewer water sampling will be performed on a contingency basis (see Section 6.6) to monitor water quality moving off site via the sewer systems.

Preventing the potential off-site migration of sediments containing SVOCs appears to be most effectively performed by removing the existing sediments in the sewers. Various sediment removal methods (flushing, reaming, vacuuming, etc.) will be reviewed as part of the Corrective Measure Evaluation (see Section 7.0). Following the removal of previously accumulated material, the sewers will be inspected for breaches or other openings that would allow the introduction of new sediments, and repaired (or abandoned) as necessary. These actions will eliminate the potential migration of sediments from the site via the sewer system.

6.4 Sewer Bedding Investigation

In addition to off-site migration via the sewer lines, it is possible that VOCs have migrated via the bedding material surrounding the sewer lines. To investigate this potential, wells will be installed in the storm and sanitary sewer bedding at two outdoor downgradient locations (see Figure 4-1): MH-5 & MH-1(San), respectively, and one indoor storm sewer manhole location: MH-12.

Because the wells must be advanced immediately adjacent to the lines, but without damaging the pipes, an "air knife" will be utilized at the outdoor locations. The air knife is equipped with a four-inch diameter hose that that can remove gravel-sized or larger materials from the borehole via high-vacuum and compressed air flow. Removed soils cannot be screened during boring advancement, but will be temporarily stored in 55-gallon drums prior to characterization and proper disposal. Off-gas vapors will be monitored with a PID.

Sewer bedding wells will be installed to approximately five feet below the invert level of the sewer pipes (total depth 11 to 13 feet). Although the air knife can be effective to depths of over ten feet (and should, at minimum, expose the sewer pipe), shallow water limits borehole advancement via this method. A Geoprobe rig will be used to complete the sewer bedding boreholes as necessary. The proposed monitoring wells will be constructed of approximately five feet of Schedule 40 2-inch diameter PVC well screen (0.010 inch slot) installed from the bottom of the borehole to the top of the sewer bedding (approximate depth 6 to 8 feet), and completed with solid Schedule 40 2-inch diameter PVC well riser to the surface. Clean silica sand (#1 or #2) will be used to fill the well annulus to at least one foot above the top of the screened interval. A one to two-foot thick bentonite seal will be installed above the gravel pack to prevent surface infiltration, and the remaining well annulus will be grouted to surface. Alternatively, these wells may be completed with Geoprobe "pre-pack" well and filter kits.

Wellhead completion, well development, and surveying of the three sewer bedding wells will be performed as described in Section 4.0. Prior to ground-water sampling, vapor samples will be collected from MH-5, MH-12 & MH-1(San) for laboratory analysis via a specialized churney well plug. The exterior of the churney plug is equipped with a quick-connect fitting and the interior of the plug includes a drop tube that will extend to approximately six inches above the water table. Prior to vapor sample collection, each well will be purged of approximately five volumes of standing air via low flow air pump (Gillian GilAir 5 or similar) at a flow rate of approximate 3.0 liters per minute (L/min.). A Summa canister will then be connected to the quick-connect fitting with dedicated tubing, and the canister intake valve adjusted to collect each vapor sample over a time period of approximately 240 minutes. Vapor samples collected in this manner should be representative of vapor conditions in the sewer bedding (and adjacent native soils) immediately above the water table. Vapor samples will be submitted for laboratory analysis of VOCs via EPA Method TO-15 plus library search and methane via EPA Modified Methods 18 & 25 (GC/FID). Following vapor sampling, liquid-level data collection and ground-water sampling for the three sewer bedding wells will be performed as discussed in Section 5.0.

6.5 Supplemental Sewer Sediment Sampling

To supplement sewer sediment samples collected during the 2001 Enhanced RFA event, sewer sediment samples will be collected from sanitary storm sewer manhole MH-1(San), and four storm sewer manholes (MH-2.5, MH-5, MH-13 & MH-15). Renewed efforts will be made to locate manhole MH-15 or a manhole farther downstream to the east. If no sediment is present, no sediment samples will be collected from the designated location; however, if sediment is not present at MH-2.5 or MH-13, alternate locations upstream along the same sewer line will be assessed for possible substitution. Sampling will proceed upstream to avoid agitation of bottom sediments at succeeding sediment sample locations (see Figure 6-1).

Immediately after each sewer manhole cover is removed, VOC vapor concentration (via PID), the lower explosive limit (LEL), and O_2 concentration will be measured approximately two to three feet below grade and at the bottom of the manhole. LEL and O_2 levels will be monitored throughout sampling procedures at each sewer sampling point. If water is present in the sewer, the depth of the water will be recorded and water velocity will be measured using a properly decontaminated portable flowmeter.

Sediment samples will be obtained from each sewer manhole using dedicated sediment "dippers" or a properly decontaminated shovel/bottom sampler. PID readings will be obtained from the sediment sample to screen for VOCs. After removing any exotic debris (leaves, trash, stones, etc.), sediment samples will be transferred to appropriate laboratory bottleware. Any excess sampling volume will be returned to the sewer. All sampling devices will be properly decontaminated (or disposed) after collecting each sediment sample (see Section 9.0).

Sewer sediment samples will be properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt for analysis of SVOCs via EPA Method 8270 plus TICs. Sample MH-1(San) will also be analyzed for VOCs via EPA Method 8260 plus TICs (see Table 6-6 for details). All analyses will include Category B laboratory deliverables. Sanitary sewer sediment samples will be clearly identified as such and kept in separate sample coolers.

6.6 Supplemental Sewer Water Sampling

Supplemental water samples will be collected from select storm and sanitary sewer locations (see Figure 6-1) if site monitoring data indicate that the water table elevation is high enough for potential infiltration of ground water to the sewer system(s). Water samples will be collected from the following storm sewer manhole locations: MH-2, MH-5, MH-10 & MH-15 (or a manhole farther downstream towards New York State Route 32), if possible, and sanitary storm sewer manhole MH-1(San).

Immediately after each sewer manhole cover is removed, VOC (via PID), LEL, and O_2 vapor concentrations will be measured approximately two to three feet below grade and at the bottom of the manhole. LEL and O_2 levels will be monitored throughout sampling procedures at each sewer sampling point. If water is present in the sewer, the depth of the water will be recorded and water velocity will be measured using a properly decontaminated portable flowmeter.

Water samples will be collected by lowering a dedicated bailer or glass jar into the sewer flow and transferring the water sample to appropriate laboratory supplied bottleware (see Table 6-6). If the sewer is dry, no samples will be collected at that location. All sewer water samples will be analyzed for VOCs via EPA Method 8260 plus heptane and TICs, and SVOCs via EPA Method 8270 plus TICs. Relevant sampling protocol have been summarized in Table 6-6. All sewer sample analyses will include Category B laboratory deliverables.

Sewer water samples will be properly labeled, logged on a chain-of-custody form, and maintained at 4°C until laboratory receipt. Sanitary sewer water samples will be clearly identified as such and kept in separate sample coolers.

SECTION 7.0

PHASE V – CORRECTIVE MEASURE EVALUATION

Based upon the supplemental Site characterization data obtained in Phases I & II of the RFI, information on ground-water flow direction, hydraulic conductivity, temporal COC trends, and other geologic/hydrogeologic data obtained during Phases III & IV, and an evaluation of possible migration pathways, a Corrective Measure evaluation will be conducted for the Site by Saint-Gobain. The evaluation will include: 1) a statement of remedial objectives; 2) identification of potential treatment areas; and 3) initial screening of Corrective Measure alternatives using a Technology Screening Matrix patterned after a USEPA model (Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA; October 1989).

The Corrective Measure evaluation will be used to: 1) design any feasibility testing that will be proposed as part of a future Corrective Measure Study (CMS); and 2) subject to a final determination by the NYSDEC, identify the necessity of any Interim Corrective Measures (ICMs) at the Site. (Based on the information obtained during the October 2001 Enhanced RFA Sampling Event, it is the opinion of Saint-Gobain that an ICM is not necessary because an Imminent Hazard to human health or the environment is not present. For example: 1) explosive vapor concentrations were not detected in any of the sewer manholes during 2001 field screening; 2) analytical data obtained from sewer and sediment samples demonstrated that TAGMs were not exceeded in 2001; and 3) ground-water samples did not exceed applicable Standards/Guidance Values. The Corrective Measure Evaluation will also present the technology identified by Saint-Gobain for the removal of existing sediments from the sanitary and storm sewers (see Section 6.0), subject to subsequent NYSDEC review and approval.

SECTION 8.0

QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

The objective of the sampling QA/QC program is to ensure the reliability and integrity of all data generated as part of the monitoring program. The QA/QC program will follow procedures outlined in the April 1994 Rust “IRM and General RFA/RFI Sampling Investigation” work plan, and will also be consistent, to the extent applicable, with NYSDEC RCRA QAPP Guidance (3/29/91). The QA/QC program will involve the collection of trip blanks, matrix spike/matrix spike duplicate (MS/MSD) samples, equipment blanks, and blind replicate samples. QA/QC sample collection is summarized in Table 8-1.

Trip Blanks

One trip blank sample will be analyzed for each ground-water sampling cooler utilized. Trip blanks will be analyzed for VOC target parameters. The trip blanks will be prepared and supplied by the laboratory, and transported and handled in the same manner as other ground-water sampling bottleware. The trip blank will be received in the field within one day of laboratory preparation and cannot be held at the field site for more than two days.

MS/MSD Samples

One set of MS/MSD samples will be collected for every twenty samples from each applicable medium (ground water and soil/sediment) and analyzed for the complete set of target parameters. Care will be taken to ensure that each MS/MSD pair can be considered a homogeneous sample split in two (however, there will be no mechanical mixing of soil samples that will be analyzed for VOCs). The MS/MSD samples will be identified as such and given a sample designation that is consistent with other analytical samples.

Equipment Blanks

One equipment blank sample will be collected from each medium sampled (ground water, soil/sediment, and vapor) during each mobilization. The equipment blank samples will be analyzed for the complete list of target analytes. The ground-water equipment blank sample will be obtained by pouring demonstrated analyte-free water through or over the sampling device so that the rinsate flows directly into the laboratory cleaned sample containers. The sediment equipment blank sample will be obtained by pouring demonstrated analyte-free water through or over the previously decontaminated sampling device so that the rinsate flows directly into the laboratory cleaned sample containers. The vapor equipment blank sample will be obtained by introducing a prepared gas sample (laboratory certified "clean air") directly into a laboratory cleaned Summa canister.

Blind Replicate Sampling

One blind replicate sample will be collected for every twenty samples collected from each medium (ground water, soil/sediment, and vapor) and analyzed for the complete set of target analytes. Care will be taken to ensure that each blind replicate can be considered a homogeneous sample split (however, there will be no mechanical mixing of soil samples that will be analyzed for VOCs).

Each blind replicate will be given a sample designation that is consistent with other analytical samples collected from the same medium to prevent the analyzing laboratory from identifying the blind replicates samples. Identification of the blind replicate samples will be provided to the NYSDEC prior to data validation (see Section 10.0).

SECTION 9.0

DECONTAMINATION PROCEDURES

All non-disposable sampling and data procurement equipment will be decontaminated using the following procedures:

1) manual scrub with alconox and potable water using a brush;
2) thorough rinse with potable water;
3) triple rinse with distilled water (ASTM Type II); and
4) air dry.

Any liquids generated during the decontamination process will be captured in properly labeled containers as described in Section 5.6, and held pending receipt of laboratory analytical results. Decontamination liquids will be treated or shipped off site for proper disposal according to the same criteria outlined in Section 5.6 for purge and development water.

SECTION 10.0

LABORATORY ANALYSIS

All soil and ground-water samples will be submitted to Adirondack Environmental Services, Inc., of Albany, New York, and all vapor samples will be submitted to Lancaster Laboratories, Inc. of Lancaster, Pennsylvania, for analysis via standard turn around times. Both laboratories are certified by the New York State Department of Health – Environmental Laboratory Approval Program (NYSDOH-ELAP). All samples will be analyzed following NYSDEC, ASP (June 2000) CLP procedures with complete NYSDEC CLP/Category B laboratory deliverables including TICs.

Data validation will be performed by the NYSDEC in accordance with the NYSDEC ASP (June 2000), the USEPA Region II document CLP Organics Data Review and Preliminary Review (SOP No. HW-6, Revision No. 8, January 1992), and USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994). Data validation will include a comparison of QC checks to prescribed acceptance criteria for the following major elements: equipment blanks, trip blanks, blind replicate samples, MS/MSD samples, laboratory qualifiers, holding times, detection limits, and accuracy. Each element will be reviewed by the NYSDEC to ensure project data quality objectives are met.

As outlined in Section 8.0, one equipment blank sample will be collected for each media (ground water, soil/sediment, and vapor) during each mobilization and analyzed for all target parameters. A sample or sample delivery group may be qualified if the equipment blank contains detectable concentrations of target analytes; however, the data may be used qualitatively to assess the quality of the decontamination procedure or ambient site conditions. A similar procedure will be followed for the utilization of trip/travel blanks.

The laboratory report may qualify the sample concentration with a "B", which indicates that a target analyte has been detected in the laboratory method blank. Data which have been qualified with a "B" will be utilized quantitatively only if the following criteria apply: 1) historical data suggests this specific compound was utilized at the facility; 2) the compound has been detected in previous analytical sampling; or 3) the laboratory case narrative states the presence of this compound is not the result of laboratory contamination. Consistent detection of compounds in the method blank suggests a laboratory contamination problem, and more importantly, problems with the internal laboratory QA/QC procedures.

The laboratory will often estimate analyte concentrations when samples are below, or greatly exceed, quantification limits. Concentrations below the laboratory method detection limit, qualified with a "J", will be used for quantitative interpretation as it represents the "best" estimate of a specific analyte concentration. Under NYSDEC ASP methods the laboratory should not report concentrations that exceed the highest concentration within the calibration range. The analysis should be rerun using an appropriate dilution factor.

Analytical data packages received from the contract laboratory will be compared with the list of analyses requested on the chain-of-custody record and the project Workplan to ensure all analyses were performed as requested. If an analytical sample exceeds the method-specific holding time (see Tables 3-1, 5-1 & 6-6), the sample will be rejected for quantitative interpretation, and the data will be utilized only in a qualitative manner.

Practical quantitation limits for each analyte should meet the Contract Required Quantitation Limit (CRQL) as per NYSDEC ASP, revised June 2000. All data will be reviewed by the NYSDEC for precision, accuracy, representativeness, completeness, and comparability (PARCC). Surrogate recoveries, GC/MS calibrations, system performance checks, and other internal laboratory QA/QC results will be reviewed to assure that the laboratory analysis met all applicable performance criteria.

SECTION 11.0

SCHEDULE & REPORTING

Per NYSDEC CO: 4-20001205-3375, RFI Workplan revisions will be submitted within 45 days of receipt of comments from the NYSDEC (or within 30 days of a meeting with the NYSDEC to discuss the RFI Workplan, if determined to be necessary). Per NYSDEC CO: 4-20001205-3375 field work is to be initiated within 30 days of receipt of final RFI Workplan approval from the NYSDEC. Based on anticipated receipt of approval, personnel and subcontractor schedules, and the time required for access negotiations, Saint-Gobain hereby requests a field work start-up date of August 25, 2003.

Progress reports summarizing the status of all activities associated with implementation of the approved RFI Workplan will be submitted to the NYSDEC on a monthly basis. The first phase of work will consist of the Geoprobe borings proposed in Section 3.0. Indoor and outdoor Geoprobe borings will be installed during the same mobilization if possible, but as noted previously, the facility is an active warehouse, and additional advance notice will likely be required for access to all indoor locations. Geoprobe soil and ground-water samples will be submitted for standard laboratory turn-around times (two to three weeks).

Within 30 days of receipt of preliminary laboratory data (prior to NYSDEC validation), any contingent monitoring well locations (and any required supplemental Geoprobe boring locations) will be finalized and submitted to the NYSDEC for approval. Within 30 days of receipt of NYSDEC approval, installation of monitoring wells (and any required supplemental Geoprobe borings) will be initiated.

Ground-water sampling and hydraulic conductivity testing will be performed at least 14 days, but no more than 30 days, after well development activities are completed at the Site. As discussed with the NYSDEC, two ground-water sampling events (Summer & Fall 2003) will be included for discussion purposes in the RFI Final and Summary Report. Monitoring well ground-water and vapor samples will be submitted for standard laboratory turn-around times (two to three weeks).

Sanitary and storm sewer sediment and water sampling is proposed on a contingency basis dependent upon observed Site conditions (see Section 6.0). The contingent sampling may be performed during any of the preceding Site mobilizations. Sewer sediment and water samples will be submitted for standard laboratory turn-around times (two to three weeks).

Copies of all final soil, sediment, ground-water, and vapor sampling laboratory data packages will be forwarded upon receipt to the NYSDEC for data validation. Within 60 days of receipt of data validation from NYSDEC for the Fall 2003 ground-water results, Saint-Gobain will submit the draft RFI Final and Summary Report to the NYSDEC for review and comment. A finalized Report will be submitted for approval within 45 days of receipt of comments from the NYSDEC (or within 30 days of a meeting with the NYSDEC to discuss the Report, if determined to be necessary). An updated summary of the proposed RFI schedule is provided as Table 11-1.

The RFI Final and Summary Report will describe all procedures, methods, and results for all activities conducted during the RFI. This information will include a summary of current site conditions, a description of the type and extent of contamination at the Site (with maps and cross sections summarizing the hydrogeologic data), a preliminary analysis of sources, migration pathways and potential receptors, and an assessment of the need for further corrective actions, including any associated feasibility testing, subject to a final determination by the NYSDEC.

SECTION 12.0

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TABLES

Table 3-1
Field Decision Matrix - Installation of Additional Geoprobe Borings
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

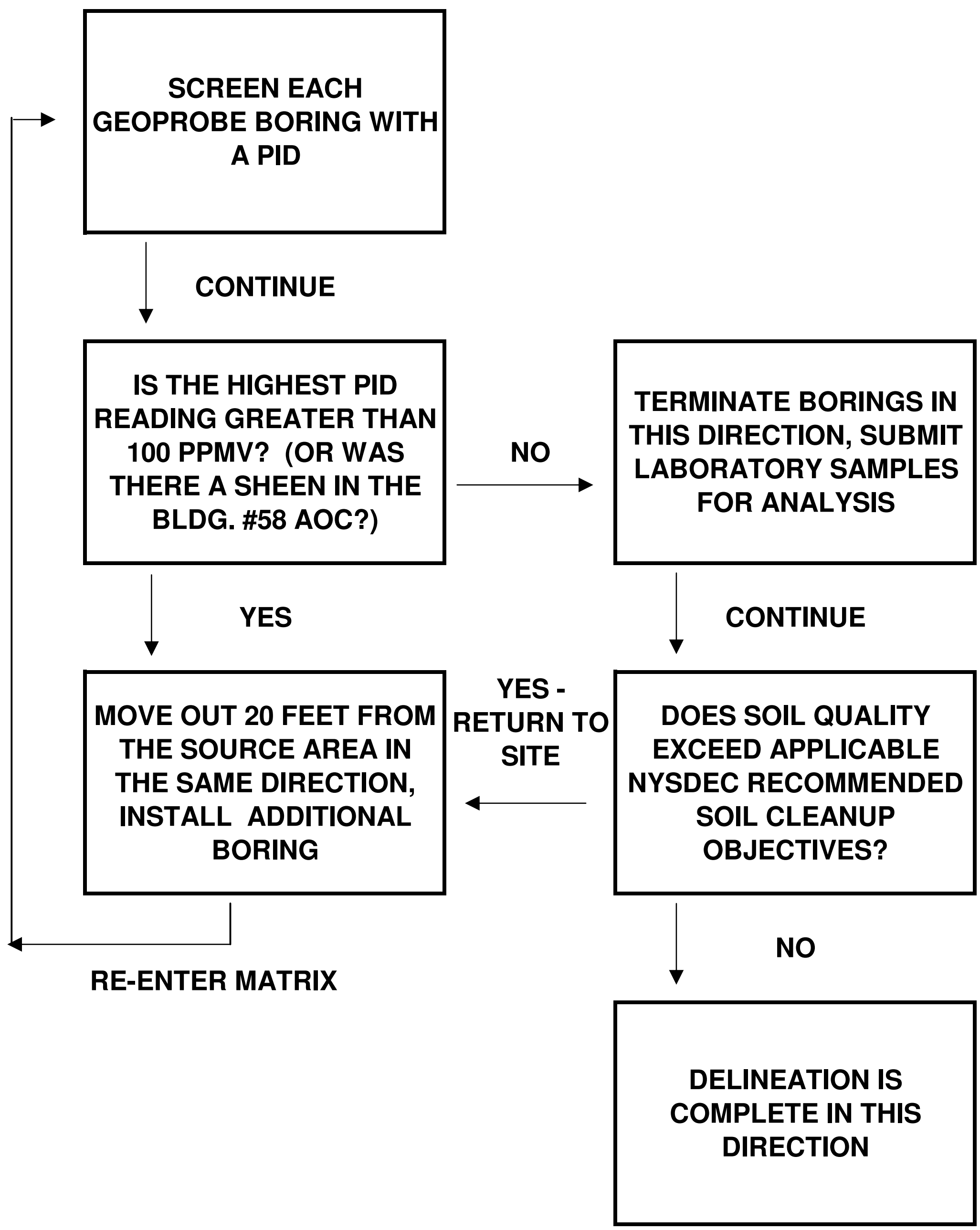


Table 3-2
Summary of Proposed Field Work
Former Norton/Nashua Facility
Watervliet, NY

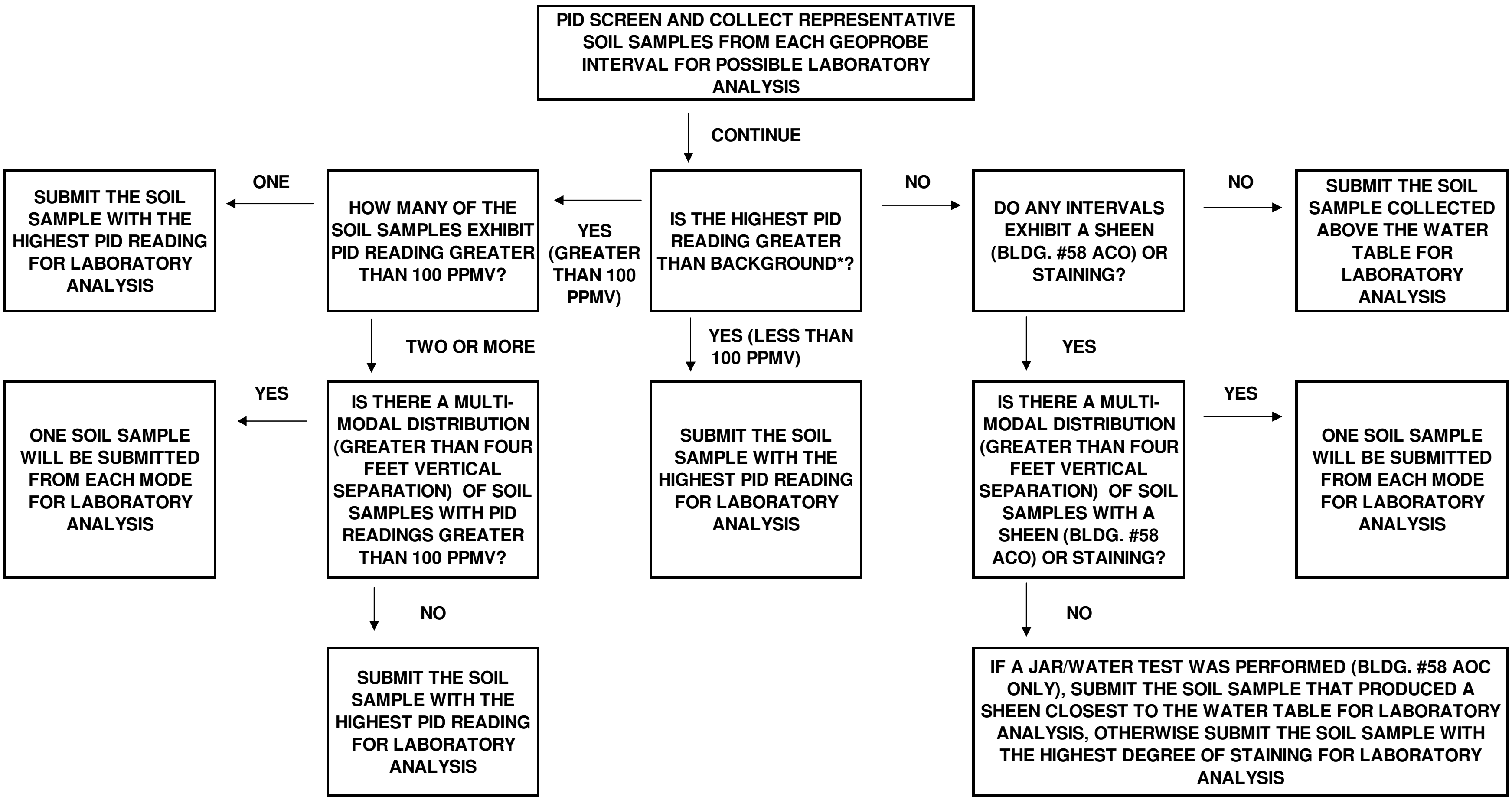
	GEOPROBE BORINGS				MONITORING WELLS	
Area of Investigation	Proposed	Soil Samples (minimum)	Water Samples (minimum)	Additional Borings Contingent on Field Data	Proposed	Monitoring Wells Contingent on Field Data
Former Tank Farm SWMU (on site)	4	4	1	Yes	5***	0
Former Tank Farm SWMU (off site)	2 - 3	2 - 3	1	Yes	0	2 - 3
Storm Sewer SWMU	0	0	0	No	2	0
Sanitary Sewer SWMU	0	0	0	No	1	0
Former "Beartex" Sump Pit SWMU	4	4	1**	Yes	0	2
Building #61 Doorway Spill AOC	1	1	1**	Yes		
Solvent Lines AOC	10	10	1**	Yes	0	1 or more
Former Test Pit AOC	5	5	1**	Yes	0	1
Building #58 AOC	10	10	1**	Yes	2	1
Solvent Recovery Room AOC	2*	2	1**	Yes	1	2
Filter Room AOC	2	2	1**	Yes		
Quonset Hut B AOC	3*	3	1**	Yes	0	1
Quonset Hut C AOC	2*	2	1	Yes	0	1
TOTALS	45 - 46	45	3	-	11***	11 or more

* contingent on building access - hand borings may be substituted
** water sample collected only if residual impact detected (defined as a PID reading greater than 100 ppmv or a sheen in the Bldg. #58 AOC - see Section 3.0)
*** includes four small-diameter monitoring points

Table 3-3
Sample Summary Matrix - Phase I - Geoprobe Borings
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Locations	Parameter	Analytical Parameter	Container and Preservative	Analysis Holding Time
Soil	Geoprobe boring sample locations (see text)	TCL Volatiles plus heptane	EPA 8260	4 oz. glass w/septum (no headspace) Cool to 4^{o}C	14 days
	Geoprobe boring sample locations (see text)	TCL Semi-Volatiles	EPA 8270	8 oz. glass Cool to 4^{o}C	14 days extraction - analysis within 40 days of extraction
Water	Select Geoprobe boring boring locations (see text)	TCL Volatiles plus heptane	EPA 8260	3 x 40ml glass vials w/teflon lined enclosure (no headspace) HCl to pH <2, Cool to 4^{o}C	14 days
	Select Geoprobe boring boring locations (see text)	TCL Semi-Volatiles	EPA 8270	2 x 1Liter amber glass w/teflon lined enclosure $Na_2S_2O_3$, Cool to 4^{o}C	7 days extraction - analysis within 40 days of extraction

Table 3-4
Field Decision Matrix - Collection of Soil Samples for Laboratory Analysis
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY



* background will be determined by screening an empty plastic bag with the field PID

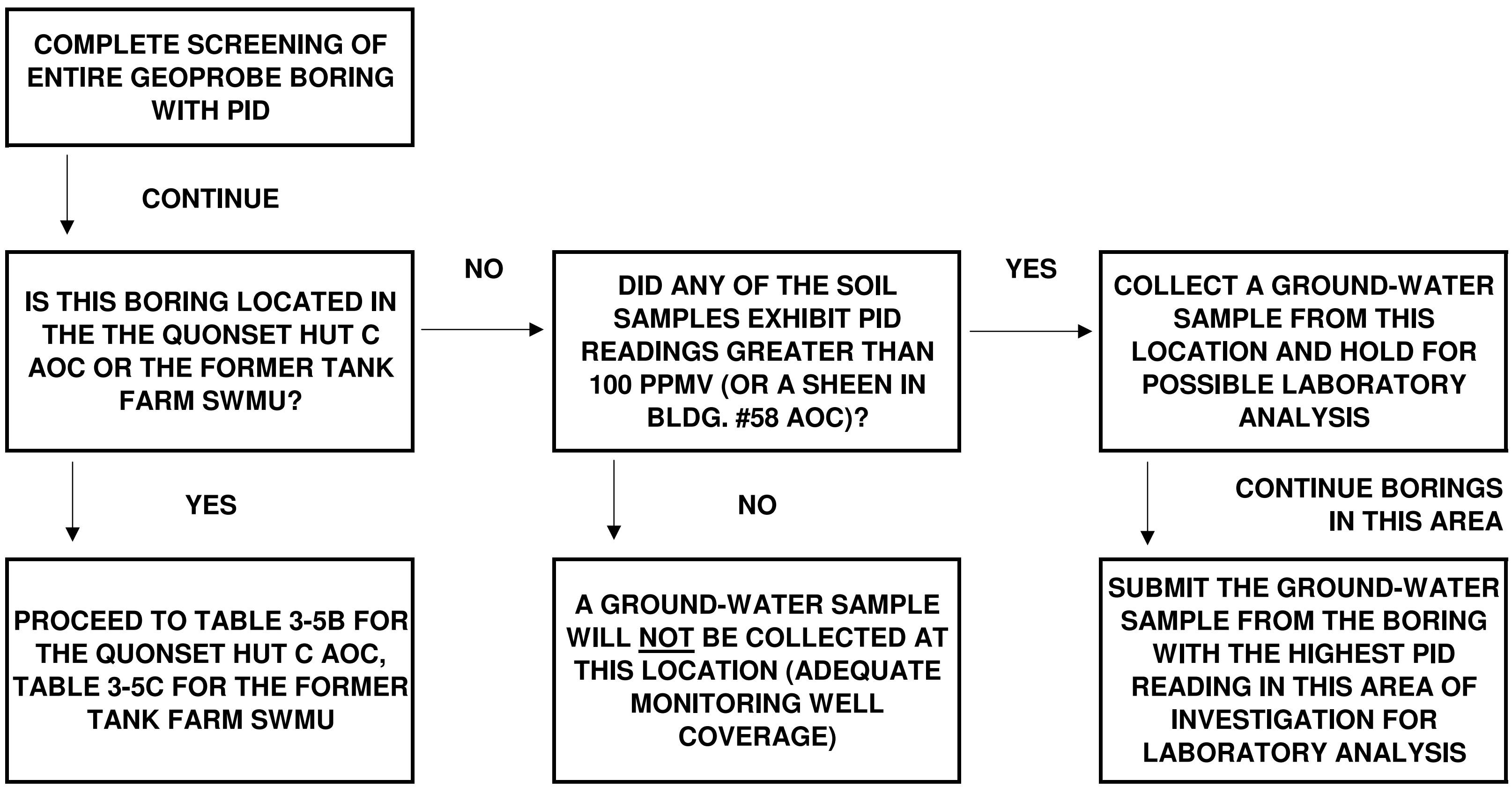
Table 3-5A

Field Decision Matrix - Collection of Geoprobe Ground-Water Samples for Laboratory Analysis

RCRA Investigation (RFI)

Former Norton/Nashua Facility

Watervliet, NY



Note: Ground-water samples will not be collected utilizing the Geoprobe in the Storm or Sanitary Sewer SWMUs because there is adequate proposed and existing monitoring well coverage in these areas

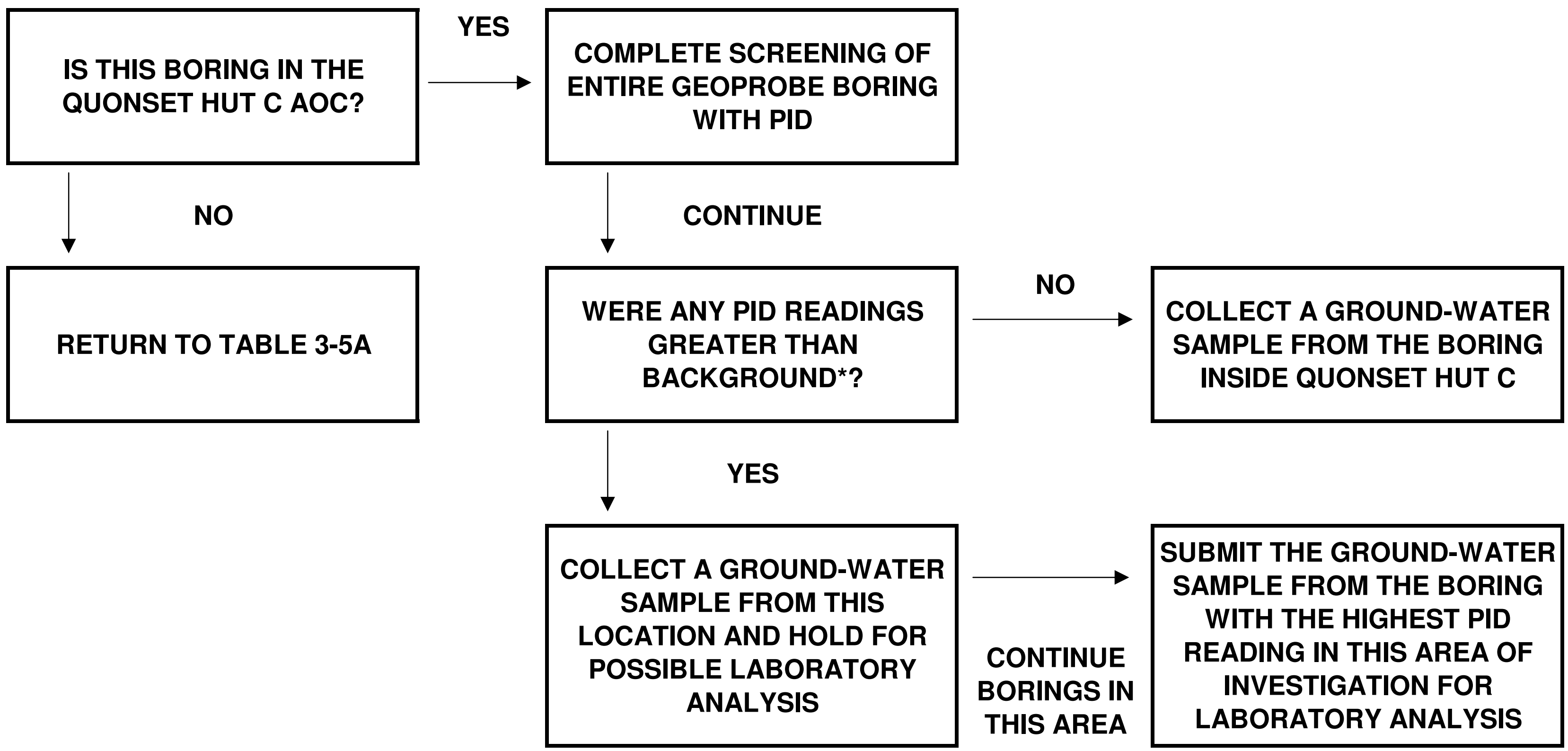
Table 3-5B

Field Decision Matrix - Collection of Geoprobe Ground-Water Samples for Laboratory Analysis

RCRA Investigation (RFI)

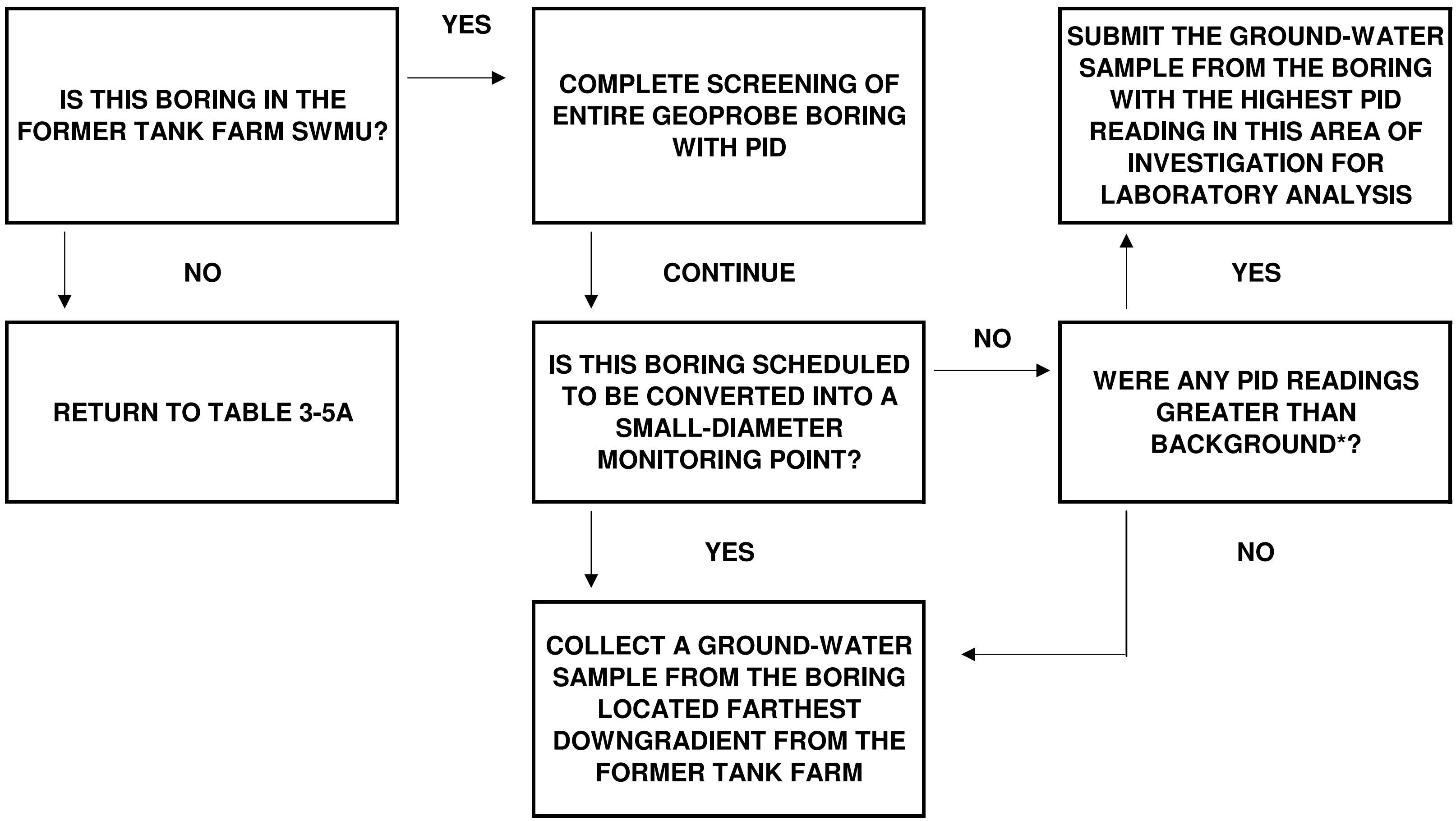
Former Norton/Nashua Facility

Watervliet, NY



* background will be determined by screening ambient air (and an empty plastic bag) with the field PID

Table 3-5C
Field Decision Matrix - Collection of Geoprobe Ground-Water Samples for Laboratory Analysis
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY



* background will be determined by screening ambient air (and an empty plastic bag) with the field PID

Table 4-1
Field Decision Matrix - Installation of Contingency Wells
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

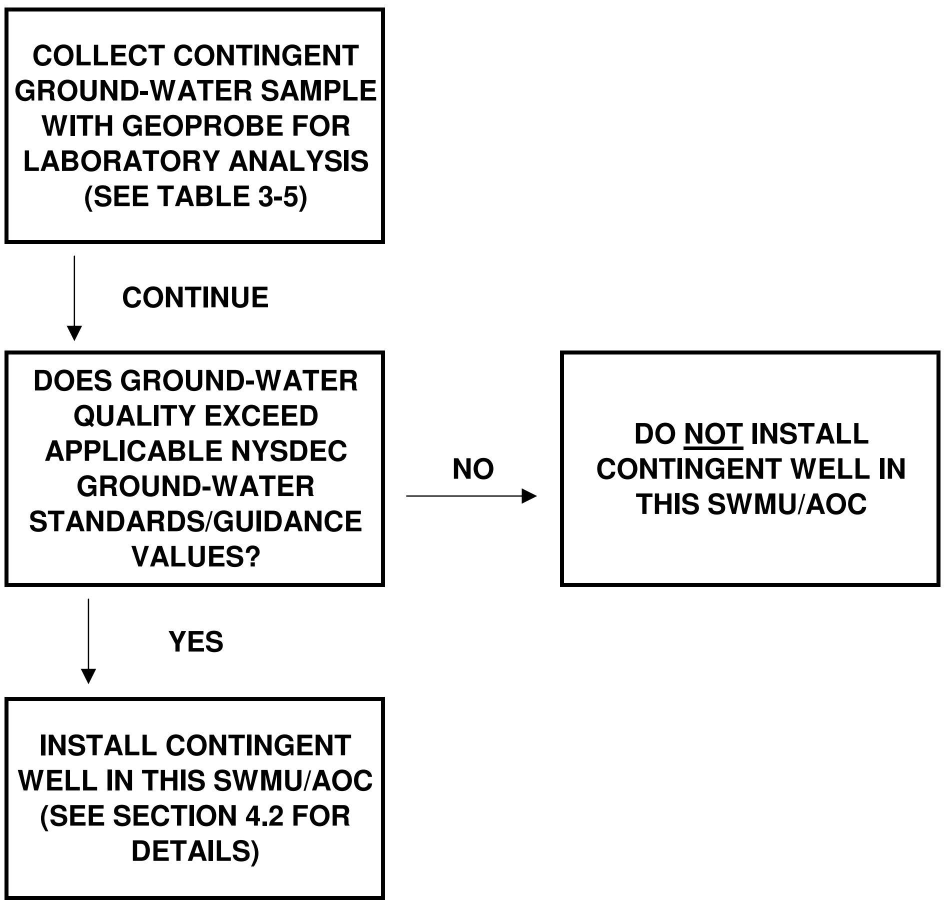


Table 5-1
Sample Summary Matrix - Phase III - Monitoring Well Sampling
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Locations	Parameter	Analytical Parameter	Container and Preservative	Analysis Holding Time
Water	DGC-1, DGC-2, DGC-4 thru DGC-10, all newly installed wells	TCL Volatiles plus heptane	EPA 8260	3 x 40ml glass vials w/teflon lined enclosure (no headspace) HCl to pH <2, Cool to 4°C	14 days
	DGC-1, DGC-2, DGC-4 thru DGC-10, all newly installed wells	TCL Semi-Volatiles	EPA 8270	2 x 1Liter amber glass w/teflon lined enclosure $Na_2S_2O_3$, Cool to 4°C	7 days extraction - analysis within 40 days of extraction
Supplemental Water	DGC-8 & DGC-9	alkalinity	EPA 310.1	200ml plastic	14 days
		hydrogen sulfide	EPA 376.1	500ml plastic, NaOH/Zinc Acetate	7 days
		total iron	EPA 200.7	250ml plastic, HNO_3 to pH <2	6 mos.
		methane/ethane/ethene	Misc. GC	1 x 40ml glass vial	14 days
		nitrate/nitrite	EPA 300.0	100ml plastic, H_2SO_4 to pH <2	28 days
		phosphate	EPA 365.1	100ml plastic, H_2SO_4 to pH <2	28 days
		sulfate	EPA 300.0	100ml plastic	28 days
		microbial counts	Standard Plate Count Methods	laboratory-specific TBD	laboratory-specific TBD

Table 6-1
Summary of Sewer Sediment Analytical Data - Volatiles
2001 Enhanced RFA
Former Norton/Nashua Facility
Watervliet, NY

Sample Designation	Sampling Date	Chloro-benzene (µg/kg)	Benzene (µg/kg)	Ethyl-benzene (µg/kg)	m,p-Xylenes (µg/kg)	o-Xylene (µg/kg)	Toluene (µg/kg)	Heptane (µg/kg)
MH-1	10/31/2001	**8**	<6	<6	<6	<6	<6	<11
MH-2	10/31/2001	<6	<6	<6	<6	<6	<6	<11
MH-2.5	10/31/2001	**100**	<6	<6	<6	<6	**4J**	<11
MH-3	10/31/2001	<5	<5	<5	<5	<5	<5	<11
MH-3.5	10/31/2001	<8	<8	<8	<8	<8	<8	<16
MH-6	10/31/2001	**8**	<6	<6	<6	<6	<6	<13
MH-9	10/31/2001	<6	<6	<6	<6	<6	<6	<12
MH-11	11/2/2001	**14**	<12	<12	<12	<12	<12	<25
MH-13	10/31/2001	<6	<6	<6	<6	<6	<6	<11
MH-FC(San)	10/31/2001	**27,000E**	**210**	**45J**	**130**	**39J**	**23J**	<180
MH-FC(San)RE	10/31/2001	**54,000E**	**500**	**160**	**570**	**210**	**340**	<180
MH-20(San)	10/31/2001	**25,000E**	**190**	<81	**140**	**32J**	<81	<160
MH-20(San)RE	10/31/2001	**48,000E**	**440**	**130**	**460**	**140**	**130**	<160
FB-1*	10/31/2001	**4J**	<6	<6	<6	<6	<6	<10
TB-1*	10/31/2001	<5	<5	<5	<5	<5	<5	<10

* aqueous sample

µg/kg = micrograms per kilogram, FB = field blank, TB = trip blank, RE = laboratory replicate
Sample MH-20(San) is a duplicate of Sample MH-FC(San).
Volatiles analyzed via EPA Method 8260 plus heptane and tentatively identified compounds (TICs).
TICs are tabulated separately.
Only detected/select analytes are listed above. A complete list of analytes is provided in the laboratory report.
Note: heptane was not detected in any of the samples, but refer to the QA/QC report qualifier (Appendix B).

Table 6-2
Summary of Sewer Water Analytical Data - Volatiles
2001 Enhanced RFA
Former Norton/Nashua Facility
Watervliet, NY

Sample Designation	Sampling Date	Toluene (µg/L)	m,p Xylenes (µg/L)
MH-5	10/31/2001	<5	<5
MH-6	10/31/2001	<5	<5
MH-11	11/2/2001	<5	<5
MH-1(San)	10/31/2001	<5	<5
MH-FC(San)	10/31/2001	<5	<5
MH-20(San)	10/31/2001	<5	<5
Alden-1	11/2/2001	<5	<5
Alden-4	11/2/2001	<5	<5
FB-2	10/31/2001	<5	<5
TB-1	10/31/2001	<5	<5
TB-3	11/2/2001	<5	<5

µg/L = micrograms per liter, FB = field blank, TB = trip blank
Sample MH-20(San) is a duplicate of Sample MH-FC(San).
Volatiles analyzed via EPA Method 8260 plus heptane and tentatively identified compounds (TICs). TICs are tabulated separately.
Only select analytes are listed above. A complete list of analytes is provided in the laboratory report.
Note: heptane was not detected in any of the samples, but refer to the QA/QC report qualifier in Appendix B.
MH-20 was a blind replicate of MH-FC(San).

Table 6-3
Summary of Sewer Sediment Analytical Data - Semi-Volatiles
2001 Enhanced RFA
Former Norton/Nashua Facility
Watervliet, NY

Sample Designation	Sampling Date	1,4-Dichloro-benzene (µg/kg)	Naph-thalene (µg/kg)	2-Methyl naphthalene (µg/kg)	Acenaph-thene (µg/kg)	Dibenzo-furan (µg/kg)	Fluorene (µg/kg)	Phenan-thene (µg/kg)
MH-6	10/31/2001	<2200	<2200	<2200	**890J**	**580J**	**1,000J**	**9,900**
MH-11	11/2/2001	<4200	<4200	<4200	**780J**	<4200	**720J**	**10,000**
MH-11RE	11/2/2001	<4200	<4200	<4200	**790J**	<4200	**770J**	**10,000**
MH-FC(San)	10/31/2001	**9,500E**	**480J**	**410J**	**450J**	<580	**530J**	**2,800**
MH-20(San)	10/31/2001	**6,900**	**370J**	**390J**	<540	<540	<540	**1,300**
MH-20(San)RE	10/31/2001	**7,300**	**350J**	**380J**	**220J**	<540	**75J**	**1,800**
FB-1*	10/31/2001	<10	<10	<10	<10	<10	<10	<10

Sample Designation	Sampling Date	Anthracene (µg/kg)	Di-n-butyl phthalate (µg/kg)	Fluor-anthene (µg/kg)	Pyrene (µg/kg)	Butylbenzyl-phthalate (µg/kg)	Benzo(a) anthracene (µg/kg)	Chrysene (µg/kg)
MH-6	10/31/2001	**4,500**	<2200	**12,000**	**14,000**	<2200	**6,700**	**7,000**
MH-11	11/2/2001	<4200	<4200	**13,000**	**31,000**	<4200	**9,400**	**11,000**
MH-11RE	11/2/2001	**4,400**	<4200	**17,000**	**23,000**	<4200	**9,900**	**12,000**
MH-FC(San)	10/31/2001	**1,700**	**2,800**	**2,700**	**5,200**	**510J**	**1,800**	**1,700**
MH-20(San)	10/31/2001	**690**	**3,600**	**1,300**	**2,200**	**390J**	**870**	**860**
MH-20(San)RE	10/31/2001	<540	**3,200**	**1,400**	**2,800**	**500J**	**1,200**	**1,200**
FB-1*	10/31/2001	<10	<10	<10	<10	<10	<10	<10

Sample Designation	Sampling Date	bis(2-Ethyl-hexyl)phthalate (µg/kg)	Di-n-octyl-phthalate (µg/kg)	Benzo(b) fluoranthene (µg/kg)	Benzo(k) fluoranthene (µg/kg)	Benzo(a) pyrene (µg/kg)	Indeno(1,2,3-cd) pyrene (µg/kg)	Benzo(g,h,i) perylene (µg/kg)
MH-6	10/31/2001	**1,200J**	<2200	**6,000**	**6,000**	**5,800**	**3,200**	**2,300**
MH-11	11/2/2001	**13,000**	<4200	**11,000**	**11,000**	**8,900**	**5,600**	**4,600**
MH-11RE	11/2/2001	**12,000**	<4200	**12,000**	**11,000**	**9,500**	**5,400**	**3,800J**
MH-FC(San)	10/31/2001	**8,500**	**510J**	**1,200**	**1,700**	**1,500**	**510J**	**370J**
MH-20(San)	10/31/2001	**7,400**	**310J**	**680**	**840**	**650**	<540	<540
MH-20(San)RE	10/31/2001	**9,300E**	**300J**	**670**	**750**	**690**	**350J**	**240J**
FB-1*	10/31/2001	<10	<10	<10	<10	<10	<10	<10

* aqueous sample

µg/kg = micrograms per kilogram, FB = field blank, TB = trip blank, RE = laboratory replicate
Sample MH-20(San) is a duplicate of Sample MH-FC(San).
Semi-volatiles analyzed via EPA Method 8270 plus tentatively identified compounds (TICs). TICs are tabulated separately.
Only detected analytes are listed above. A complete list of analytes is provided in the laboratory report.

Table 6-4
Summary of Sewer Water Analytical Data - Semi-Volatiles
2001 Enhanced RFA
Former Norton/Nashua Facility
Watervliet, NY

Sample Designation	Sampling Date	Phenol (µg/L)	4-Methyl-phenol (µg/L)	Phenan-threne (µg/L)	Anthracene (µg/L)	Fluor-anthene (µg/L)	Pyrene (µg/L)	Benzo(a) anthracene (µg/L)
MH-5	10/31/2001	<10	<10	**4J**	**2J**	**7J**	**6J**	**3J**
MH-6	10/31/2001	<10	<10	**5J**	**2J**	**9J**	**8J**	**4J**
MH-11	11/2/2001	<10	<10	<10	<10	<10	<10	<10
MH-1(San)	10/31/2001	**35J**	**130**	<50	<50	**5J**	**6J**	<50
MH-1(San)RE	10/31/2001	**39J**	**130**	<50	<50	<50	<50	<50
MH-FC(San)	10/31/2001	<10	<10	<10	<10	<10	<10	<10
MH-20(San)	10/31/2001	<10	<10	<10	<10	<10	<10	<10
Alden-1	11/2/2001	<10	<10	<10	<10	<10	<10	<10
Alden-4	11/2/2001	**3J**	**16**	<10	<10	<10	<10	<10
FB-2	10/31/2001	<10	<10	<10	<10	<10	<10	<10

Sample Designation	Sampling Date	Chrysene (µg/L)	Bis-(2-ethyl-hexyl)phthalate (µg/L)	Benzo(b) fluoranthene (µg/L)	Benzo(k) fluoranthene (µg/L)	Benzo(a) pyrene (µg/L)	Indeno(1,2,3-cd)pyrene (µg/L)	Benzo(g,h,i) perylene (µg/L)
MH-5	10/31/2001	**4J**	**2J**	**3J**	**4J**	**3J**	**2J**	**2J**
MH-6	10/31/2001	**5J**	**3J**	**4J**	**5J**	**4J**	**2J**	**2J**
MH-11	11/2/2001	<10	<10	<10	<10	<10	<10	<10
MH-1(San)	10/31/2001	<50	**65**	<50	<50	<50	<50	<50
MH-1(San)RE	10/31/2001	<50	**84**	<50	<50	<50	<50	<50
MH-FC(San)	10/31/2001	<10	**2J**	<10	<10	<10	<10	<10
MH-20(San)	10/31/2001	<10	**1J**	<10	<10	<10	<10	<10
Alden-1	11/2/2001	<10	<10	<10	<10	<10	<10	<10
Alden-4	11/2/2001	<10	**3J**	<10	<10	<10	<10	<10
FB-2	10/31/2001	<10	<10	<10	<10	<10	<10	<10

µg/L = micrograms per liter, FB = field blank, TB = trip blank, RE = laboratory replicate
Sample MH-20(San) is a duplicate of Sample MH-FC(San).
Semi-volatiles via EPA Method 8270 plus tentatively identified compounds (TICs). TICs are tabulated separately.
Only detected analytes are listed above. A complete list of analytes is provided in the laboratory report.
MH-20 was a blind replicate of MH-FC(San).

Table 6-5
Summary of Ground-Water Analytical Data - Volatiles
2001 Enhanced RFA
Former Norton/Nashua Facility
Watervliet, NY

Sample Designation	Sampling Date	Toluene (µg/L)	m,p-Xylenes (µg/L)
DGC-1	11/1/2001	<5	<5
DGC-2	11/1/2001	<5	<5
DGC-4	11/1/2001	<5	<5
DGC-5	11/1/2001	<5	<5
DGC-6	11/1/2001	<5	<5
DGC-7	11/1/2001	**150**	<5
DGC-8	11/1/2001	**88,000E**	**150J**
DGC-8DL	11/1/2001	**200,000**	<5000
DGC-9	11/1/2001	<5	<5
DGC-10	11/1/2001	<5	<5
FB-3	11/1/2001	<5	<5
TB-2	11/1/2001	<5	<5

µg/L = micrograms per liter, FB = field blank, TB = trip blank
Volatiles analyzed via EPA Method 8260 plus heptane and tentatively identified compounds (TICs). No TICs were detected in the samples.
Only detected analytes are listed above. A complete list of analytes is provided in the laboratory report.
Note: heptane was not detected in any of the samples, but refer to the QA/QC report qualifier (Appendix B).

Table 6-6
Sample Summary Matrix - Phase IV - Sewer Samples
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Locations	Parameter	Analytical Parameter	Container and Preservative	Analysis Holding Time
Soil	MH-1(San)	TCL Volatiles plus heptane	EPA 8260	4 oz. glass w/septum (no headspace) Cool to 4°C	14 days
	MH-1(San) MH-2.5, MH-5, MH-12, MH-13 & MH-15	TCL Semi-Volatiles	EPA 8270	8 oz. glass Cool to 4°C	14 days extraction - analysis within 40 days of extraction
Water (Contingent)	MH-1(San) MH-2, MH-5, MH-12, MH-13 & MH-15	TCL Volatiles plus heptane	EPA 8260	3 x 40ml glass vials w/teflon lined enclosure (no headspace) HCl to pH <2, Cool to 4°C	14 days
	MH-1(San) MH-2, MH-5, MH-12, MH-13 & MH-15	TCL Semi-Volatiles	EPA 8270	2 x 1Liter amber glass w/teflon lined enclosure $Na_2S_2O_3$, Cool to 4°C	7 days extraction - analysis within 40 days of extraction
Vapor	two new wells installed in sewer bedding near MH-1(San) & MH-5 (plus contingent well near MH-12)	volatiles plus methane	EPA TO-15, EPA Modified 18 & 25	Summa canister	14 days

Table 8-1
QA/QC Sample Summary Matrix
RCRA Investigation (RFI)
Former Norton/Nashua Facility
Watervliet, NY

Matrix	Sample Type	Frequency	Analytical Parameters
Water	Equipment Blank	one sample per each mobilization	TCL Volatiles plus heptane and TICs TCL Semi-Volatiles and TICs
	MS/MSD Samples	one sample per every 20 samples	TCL Volatiles plus heptane and TICs TCL Semi-Volatiles and TICs
	Blind Replicate Sample	one sample per every 20 samples	TCL Volatiles plus heptane and TICs TCL Semi-Volatiles and TICs
	Trip Blank	one sample per cooler	TCL Volatiles plus heptane and TICs
Sediment	Equipment Blank	one sample per each mobilization	TCL Volatiles plus heptane and TICs TCL Semi-Volatiles and TICs
	MS/MSD Samples	one sample per every 20 samples	TCL Volatiles plus heptane and TICs TCL Semi-Volatiles and TICs
	Blind Replicate Sample	one sample per every 20 samples	TCL Volatiles plus heptane and TICs TCL Semi-Volatiles and TICs
Vapor	Equipment Blank	one sample per each mobilization	Volatiles plus TICs methane
	Ambient Air	one sample each sampling day	Volatiles plus TICs methane
	Replicate Sample	one sample each sampling day	Volatiles plus TICs methane

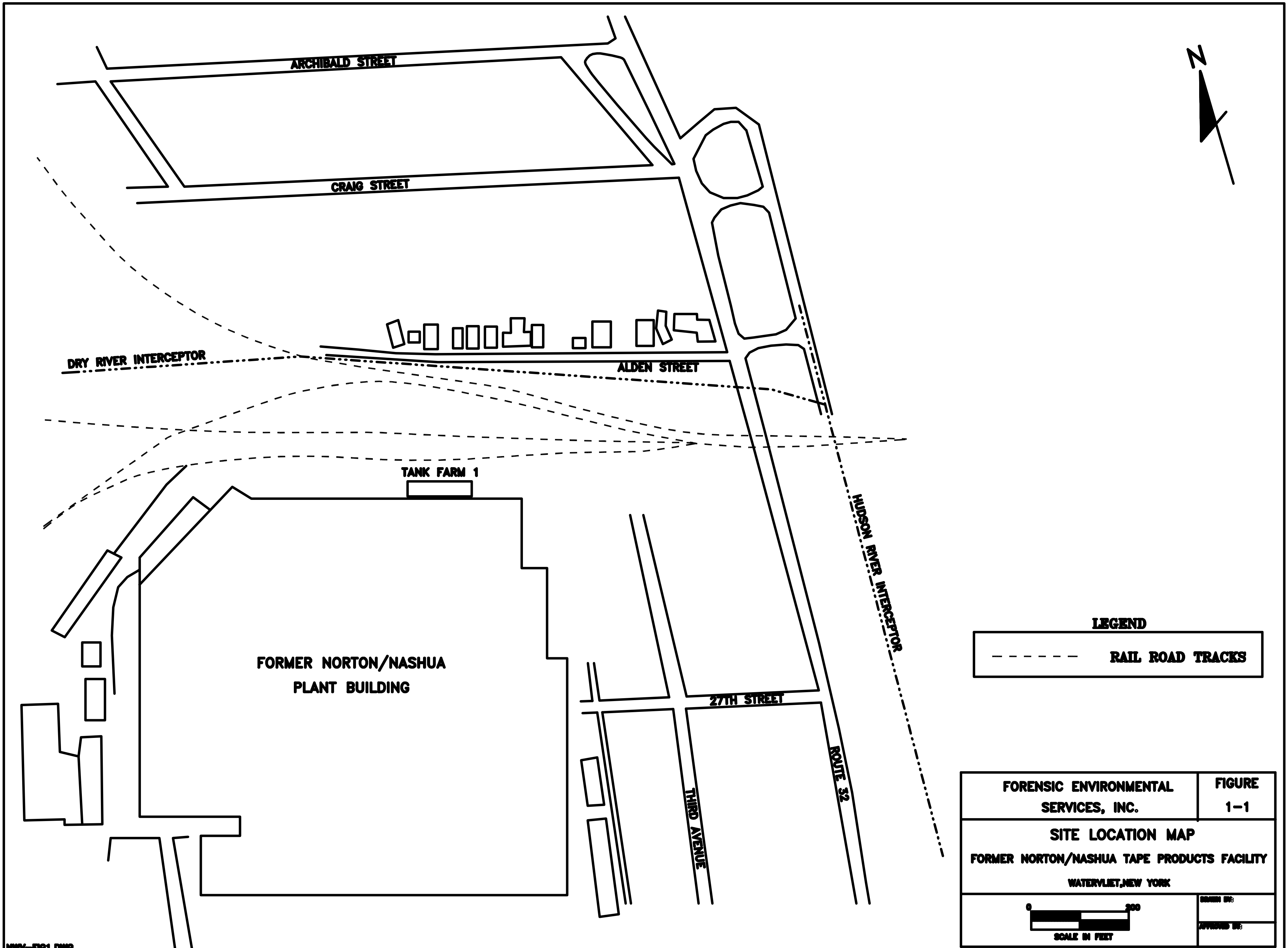
Water and sediments - Volatile analysis via EPA Method 8260; semi-volatile analysis via EPA Method 8270
Vapor - Volatile analysis via EPA Method TO-15; methane analysis via EPA Modified Methods 18 & 25

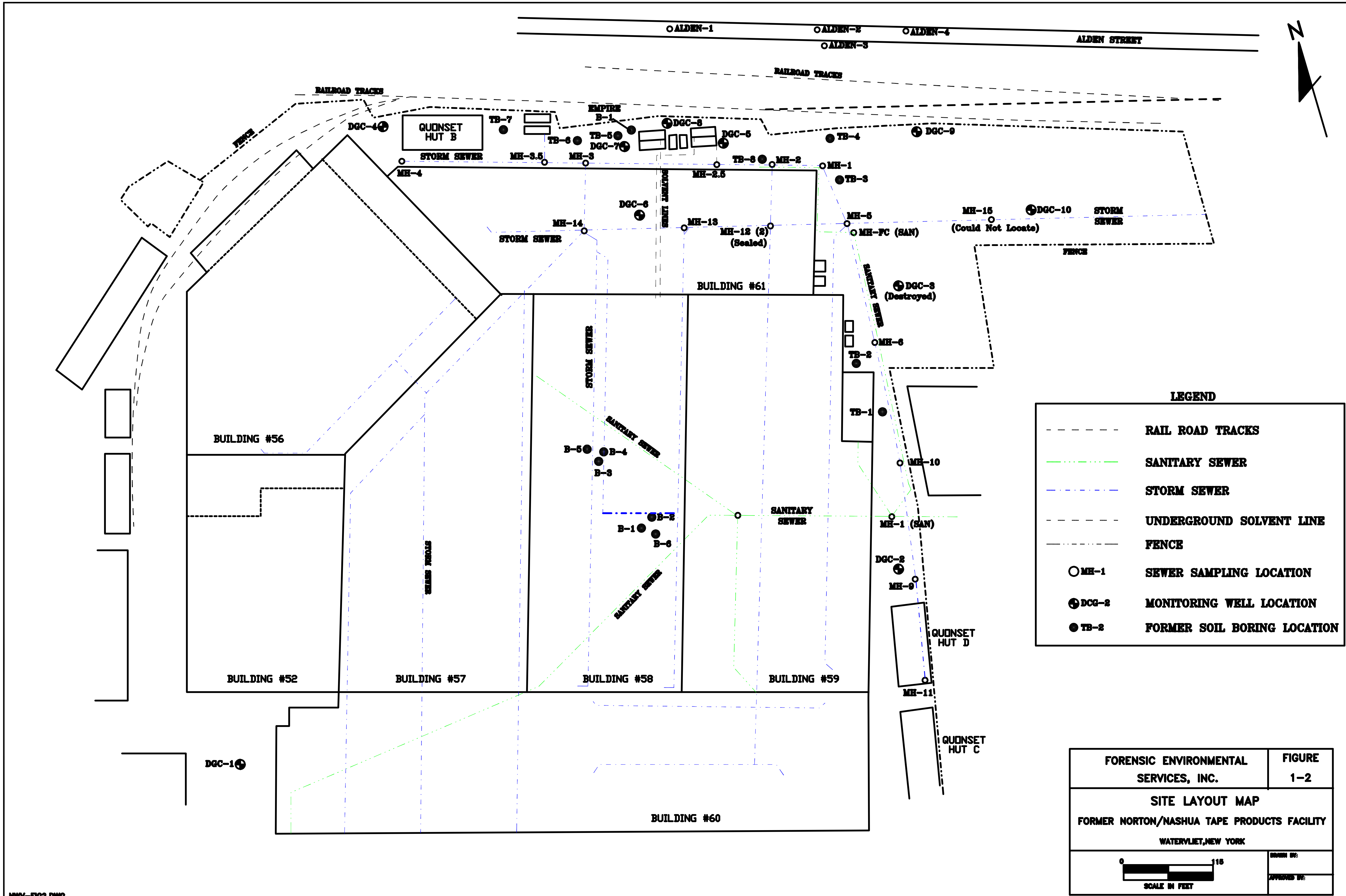
Table 11-1
Tentative RFI Project Schedule
Former Norton/Nashua Tape Facility
Watervliet, New York

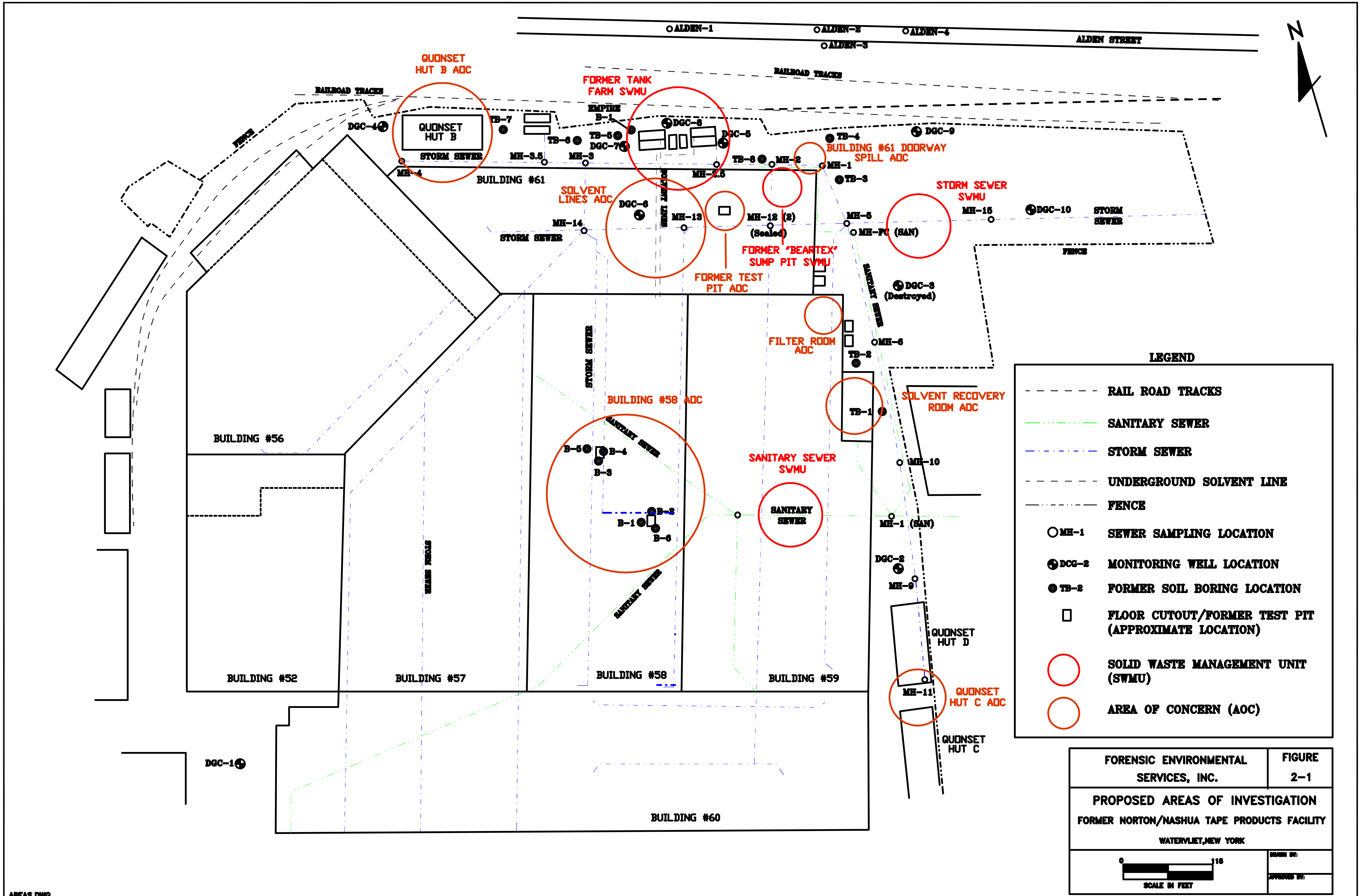
	June	3Q 2003			4Q 2003			1Q 2004			2Q 2004		
	2003	7	8	9	10	11	12	1	2	3	4	5	6
RFI Tasks													
Revised RFI Workplan Submittal & NYSDEC Review													
Obtain Site Access, Mobilization													
Phase I - Geoprobe Borings (Round One), Laboratory Analysis													
Phase I - Geoprobe Borings (Round Two), Laboratory Analysis*													
Phase I - Obtain Railroad Access, Install Borings/Wells			?	?	?								
Phase II - Install & Develop Monitoring Wells, Survey													
Phases III & IV - Monitoring Well & Sewer Sampling Events													
Laboratory Analysis & NYSDEC Data Validation													
Phase V - Corrective Measures Evaluation													
Preparation & Submittal of Draft RFI Final Report													

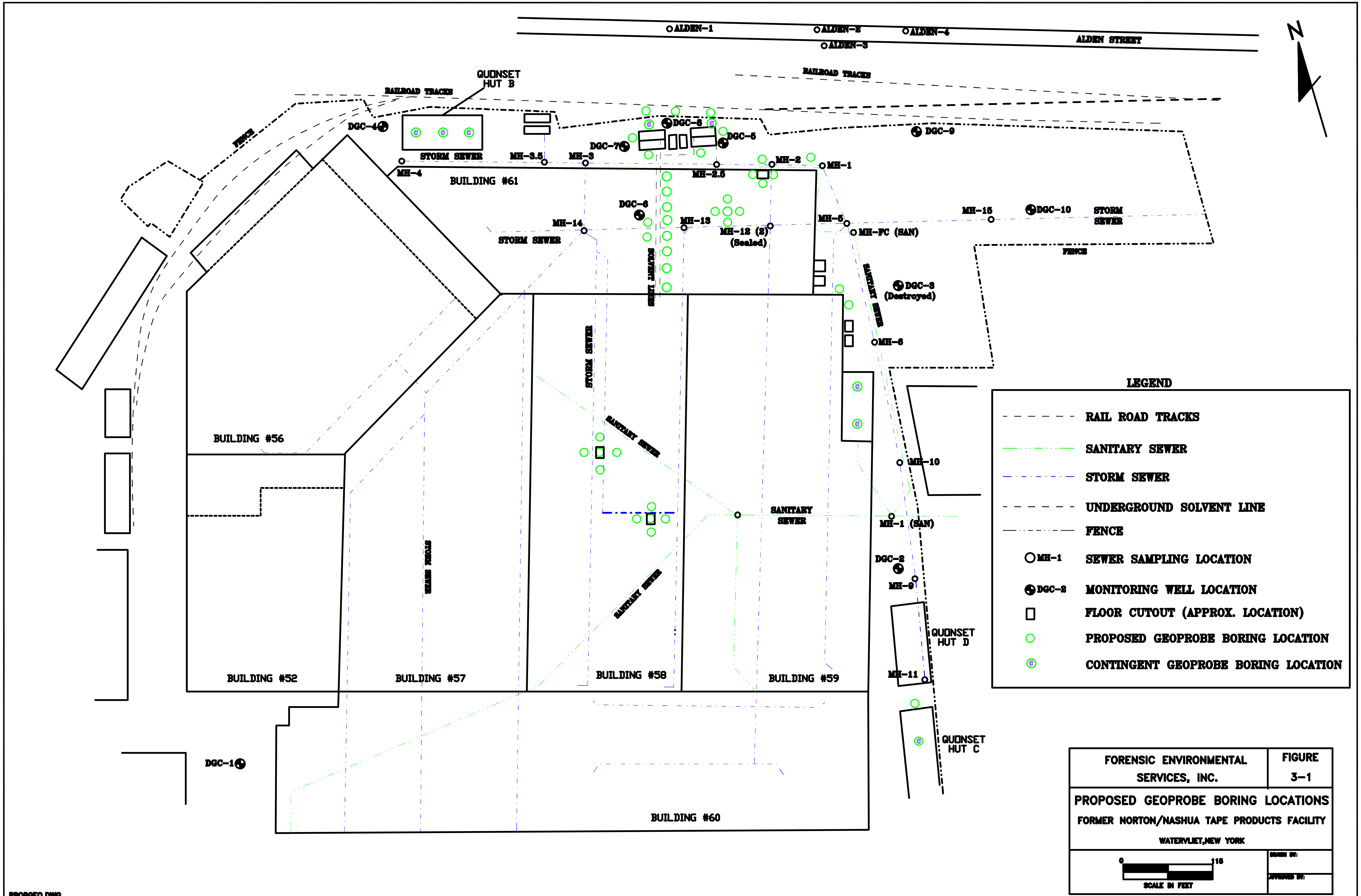
* if necessary

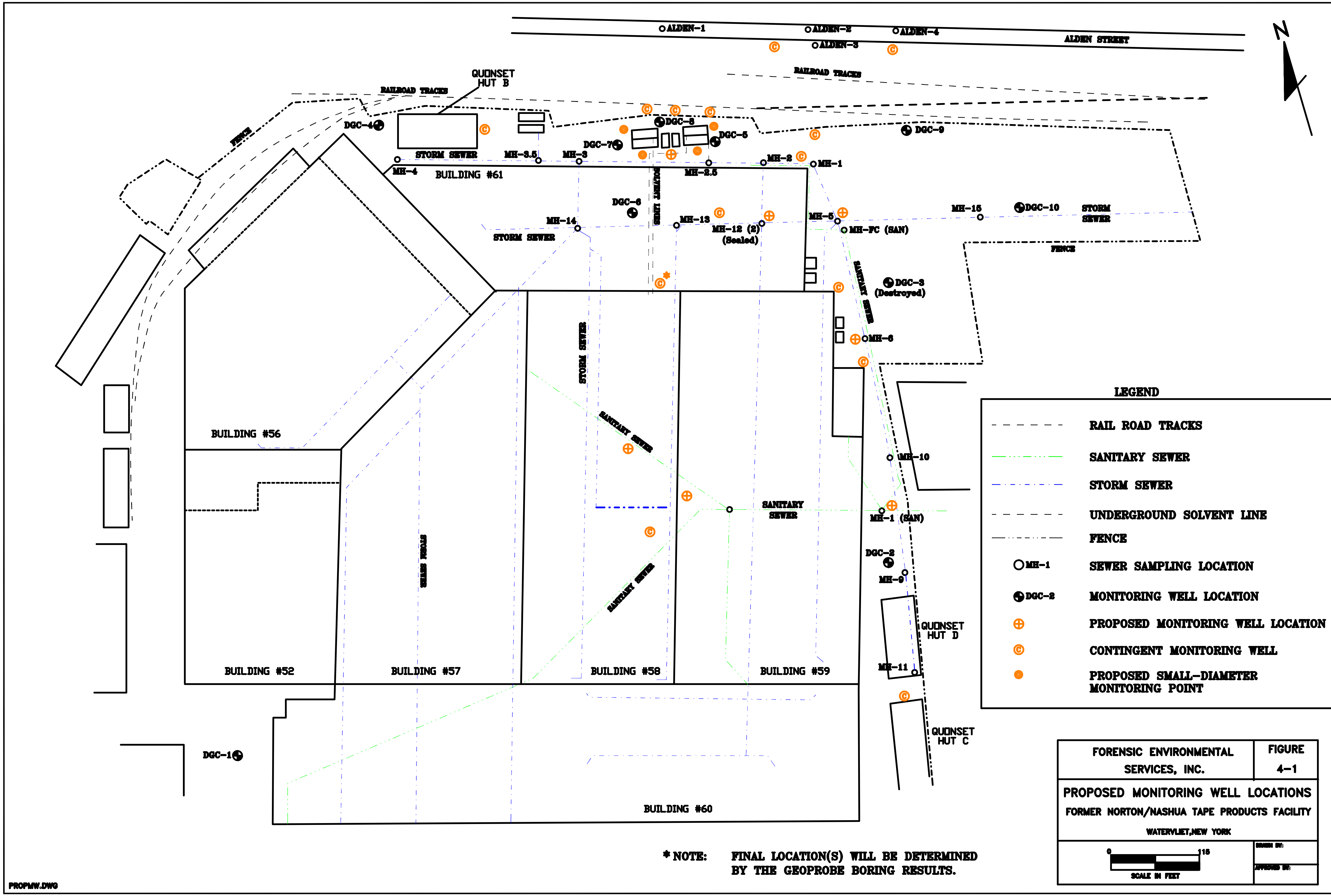
FIGURES

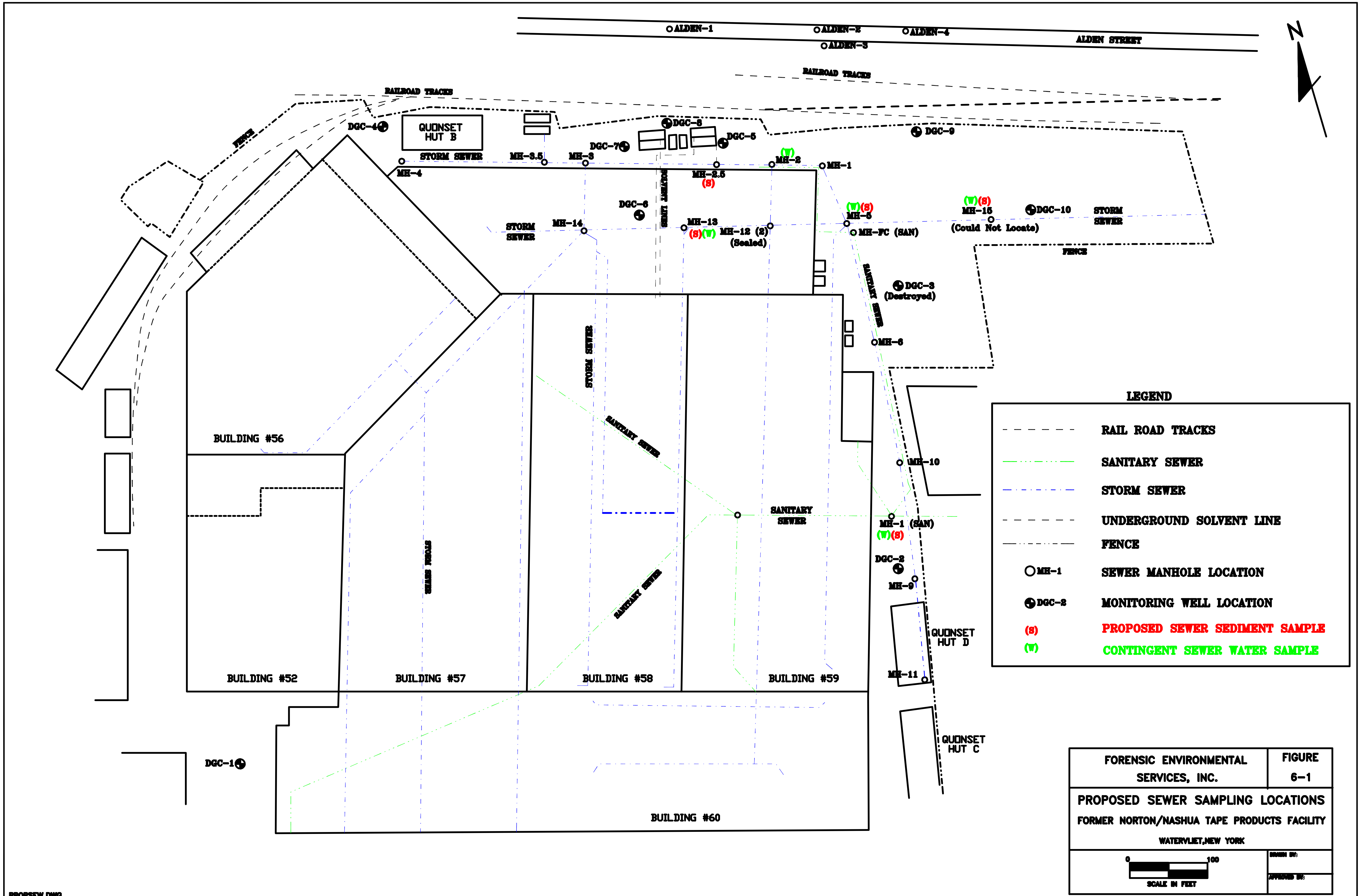

N
ARCHIBALD STREET
CRAIG STREET
DRY RIVER INTERCEPTOR
ALDEN STREET
TANK FARM 1
HUDSON RIVER INTERCEPTOR
FORMER NORTON/NASHUA
PLANT BUILDING
27TH STREET
THIRD AVENUE
ROUTE 32
LEGEND
RAIL ROAD TRACKS
FORENSIC ENVIRONMENTAL
SERVICES, INC.
FIGURE
1-1
SITE LOCATION MAP
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET,NEW YORK
0
200
SCALE IN FEET
NWV-FIG1.DWG


ALDEN STREET
ALDEN-1
ALDEN-2
ALDEN-3
ALDEN-4
RAILROAD TRACKS
FENCE
QUONSET HUT B
EMPIRE B-1
STORM SEWER
SOLVENT LINE
BUILDING #61
BUILDING #56
BUILDING #52
BUILDING #57
BUILDING #58
BUILDING #59
BUILDING #60
SANITARY SEWER
MH-12 (2) (Sealed)
MH-FC (SAN)
MH-15 (Could Not Locate)
DGC-3 (Destroyed)
MH-1 (SAN)
QUONSET HUT D
QUONSET HUT C
LEGEND
RAIL ROAD TRACKS
SANITARY SEWER
STORM SEWER
UNDERGROUND SOLVENT LINE
FENCE
MH-1 SEWER SAMPLING LOCATION
DCG-2 MONITORING WELL LOCATION
TB-2 FORMER SOIL BORING LOCATION
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 1-2
SITE LAYOUT MAP
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET,NEW YORK
SCALE IN FEET
NWV-FIG2.DWG


ALDEN-1
ALDEN-2
ALDEN-3
ALDEN-4
ALDEN STREET
RAILROAD TRACKS
N
QUONSET HUT B AOC
FORMER TANK FARM SWMU
EMPIRE B-1
DGC-4
QUONSET HUT B
TB-7
TB-6
TB-5
DGC-7
DGC-8
DGC-5
DGC-9
TB-4
BUILDING #61 DOORWAY SPILL AOC
TB-8
MH-2
MH-1
TB-3
STORM SEWER
MH-3.5
MH-3
MH-4
MH-2.5
BUILDING #61
SOLVENT LINES AOC
DGC-6
MH-13
MH-12 (2) (Sealed)
MH-14
STORM SEWER SWMU
MH-5
MH-15
DGC-10
STORM SEWER
MH-FC (SAN)
FENCE
FORMER "BEARTEX" SUMP PIT SWMU
FORMER TEST PIT AOC
DGC-3 (Destroyed)
SANITARY SEWER
FILTER ROOM AOC
MH-6
TB-2
BUILDING #58 AOC
SOLVENT RECOVERY ROOM AOC
TB-1
BUILDING #56
B-5
B-4
B-3
MH-10
SANITARY SEWER SWMU
B-2
B-1
B-6
MH-1 (SAN)
DGC-2
MH-9
QUONSET HUT D
BUILDING #52
BUILDING #57
BUILDING #58
BUILDING #59
MH-11
QUONSET HUT C AOC
QUONSET HUT C
DGC-1
BUILDING #60
LEGEND
RAIL ROAD TRACKS
SANITARY SEWER
STORM SEWER
UNDERGROUND SOLVENT LINE
FENCE
MH-1 SEWER SAMPLING LOCATION
DCG-2 MONITORING WELL LOCATION
TB-2 FORMER SOIL BORING LOCATION
FLOOR CUTOUT/FORMER TEST PIT (APPROXIMATE LOCATION)
SOLID WASTE MANAGEMENT UNIT (SWMU)
AREA OF CONCERN (AOC)
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 2-1
PROPOSED AREAS OF INVESTIGATION
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
0
115
SCALE IN FEET
AREAS.DWG


ALDEN-1
ALDEN-2
ALDEN-3
ALDEN-4
ALDEN STREET
N
RAILROAD TRACKS
RAILROAD TRACKS
QUONSET HUT B
FENCE
DGC-4
STORM SEWER
MH-3.5
MH-3
DGC-8
DGC-7
DGC-5
DGC-9
MH-4
BUILDING #61
MH-2.5
MH-2
MH-1
DGC-6
MH-14
MH-13
MH-12 (2) (Sealed)
MH-5
MH-FC (SAN)
MH-15
DGC-10
STORM SEWER
STORM SEWER
FENCE
SOLVENT LINES
SANITARY SEWER
DGC-3 (Destroyed)
MH-6
STORM SEWER
BUILDING #56
SANITARY SEWER
MH-10
SANITARY SEWER
MH-1 (SAN)
STORM SEWER
DGC-2
MH-9
SANITARY SEWER
QUONSET HUT D
BUILDING #52
BUILDING #57
BUILDING #58
BUILDING #59
MH-11
QUONSET HUT C
DGC-1
BUILDING #60
LEGEND
RAIL ROAD TRACKS
SANITARY SEWER
STORM SEWER
UNDERGROUND SOLVENT LINE
FENCE
MH-1 SEWER SAMPLING LOCATION
DGC-2 MONITORING WELL LOCATION
FLOOR CUTOUT (APPROX. LOCATION)
PROPOSED GEOPROBE BORING LOCATION
CONTINGENT GEOPROBE BORING LOCATION
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 3-1
PROPOSED GEOPROBE BORING LOCATIONS
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET,NEW YORK
0
115
SCALE IN FEET
DRAWN BY:
APPROVED BY:
PROPGEO.DWG


ALDEN-1
ALDEN-2
ALDEN-3
ALDEN-4
ALDEN STREET
N
RAILROAD TRACKS
RAILROAD TRACKS
QUONSET HUT B
FENCE
DGC-4
DGC-8
DGC-5
DGC-7
DGC-9
STORM SEWER
MH-3.5
MH-3
MH-4
BUILDING #61
MH-2.5
MH-2
MH-1
SOLVENT LINES
DGC-6
MH-14
MH-13
MH-12 (2) (Sealed)
MH-5
MH-FC (SAN)
MH-15
DGC-10
STORM SEWER
STORM SEWER
FENCE
SANITARY SEWER
DGC-3 (Destroyed)
MH-6
STORM SEWER
SANITARY SEWER
SANITARY SEWER
SANITARY SEWER
STORM SEWER
MH-10
MH-1 (SAN)
DGC-2
MH-9
QUONSET HUT D
MH-11
QUONSET HUT C
BUILDING #56
BUILDING #52
BUILDING #57
BUILDING #58
BUILDING #59
BUILDING #60
DGC-1
LEGEND
RAIL ROAD TRACKS
SANITARY SEWER
STORM SEWER
UNDERGROUND SOLVENT LINE
FENCE
MH-1 SEWER SAMPLING LOCATION
DGC-2 MONITORING WELL LOCATION
PROPOSED MONITORING WELL LOCATION
CONTINGENT MONITORING WELL
PROPOSED SMALL-DIAMETER MONITORING POINT
* NOTE: FINAL LOCATION(S) WILL BE DETERMINED BY THE GEOPROBE BORING RESULTS.
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 4-1
PROPOSED MONITORING WELL LOCATIONS
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
0
115
SCALE IN FEET
DRAWN BY:
APPROVED BY:
PROPMW.DWG


ALDEN-1
ALDEN-2
ALDEN-3
ALDEN-4
ALDEN STREET
RAILROAD TRACKS
RAILROAD TRACKS
FENCE
N
QUONSET HUT B
DGC-4
DGC-8
DGC-7
DGC-5
DGC-9
STORM SEWER
MH-3.5
MH-3
MH-4
MH-2.5
(S)
(W)
MH-2
MH-1
DGC-6
SOLVENT LINES
STORM SEWER
MH-14
MH-13
(S)(W)
MH-12 (2)
(Sealed)
(W)(S)
MH-5
MH-FC (SAN)
(W)(S)
MH-15
(Could Not Locate)
DGC-10
STORM SEWER
FENCE
SANITARY SEWER
DGC-3
(Destroyed)
MH-6
STORM SEWER
SANITARY SEWER
SANITARY SEWER
SANITARY SEWER
STORM SEWER
BUILDING #56
BUILDING #52
BUILDING #57
BUILDING #58
BUILDING #59
BUILDING #60
MH-10
MH-1 (SAN)
(W)(S)
DGC-2
MH-9
QUONSET HUT D
MH-11
QUONSET HUT C
DGC-1
LEGEND
RAIL ROAD TRACKS
SANITARY SEWER
STORM SEWER
UNDERGROUND SOLVENT LINE
FENCE
MH-1 SEWER MANHOLE LOCATION
DGC-2 MONITORING WELL LOCATION
(S) PROPOSED SEWER SEDIMENT SAMPLE
(W) CONTINGENT SEWER WATER SAMPLE
FORENSIC ENVIRONMENTAL SERVICES, INC.
FIGURE 6-1
PROPOSED SEWER SAMPLING LOCATIONS
FORMER NORTON/NASHUA TAPE PRODUCTS FACILITY
WATERVLIET, NEW YORK
0
100
SCALE IN FEET
DRAWN BY:
APPROVED BY:
PROPSEW.DWG