STATE OF DELAWARE

DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
SITE INVESTIGATION AND RESTORATION BRANCH

AMENDED FINAL PLAN OF REMEDIAL ACTION

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Meco Drive Site Collection Trench (OU-1)
Wilmington, Delaware **DNREC Project No. DE-1103**

This amended Final Plan of Remedial Action (Final Plan) presents the Department of Natural Resources and Environmental Control-Site Investigation and Restoration Branch (DNREC-SIRB) cleanup alternative for the remediation at the Meco Drive project (Site) (also known as the Wayman Fire Protection project).

The purpose of the Amended Final Plan is to modify the conditions of the original Final Plan of Remedial Action for the Site issued in January 2005. The January 2005 Final Plan of Remedial Action is herein modified to reflect an alternate method of treated water discharge as well as to divide the Site into two separate Operable Units (OUs). The State of Delaware Surface Water Discharge Regulations made the alternate method of water treatment necessary. In light of the treated water, discharge Regulations, the January 2005 Final Plan has become cost prohibitive. Separation of the Site into two (2) OUs allows for expedited implementation of a remedy that achieves one (1) of the Remedial Action Objectives from the January 2005 Final Plan. This separation will provide an avenue by which DNREC-SIRB can complete further delineation of Site contaminants.

In addition, as required by Section 12 of the Delaware Regulations Governing Hazardous Substance Cleanup (HSCA Regulations), DNREC provided notice to the public and an opportunity for the public to comment on the Amended Proposed Plan. DNREC received no public comments during the public participation period for the Amended Proposed Plan of Remedial Action. The amendments to this plan reflect constraints placed on the project by State of Delaware regulations and the prohibitive costs associated with the implementation of the January 2005 Final Plan. The Amended Final Plan will designate the selected remedy for the Site. All investigations of the Site, the Proposed Plan, the Amended Proposed Plan, comments

received from the public, DNREC-SIRB's responses to the comments, and the Amended Final Plan will constitute the Remedial Decision Record.

This Amended Final Plan summarizes the findings of the 2000 Remedial Investigation (RI) and the 2002 Feasibility Study (FS) with a 2004 FS Addendum, and the administrative record file upon which this Final Plan is based. The public can obtain or view copies of Site-related documents at the locations listed at the end of this document.

INTRODUCTION

The Meco Drive project consists of seven (7) adjacent properties along Meco Drive, in Wilmington, Delaware. Site properties include #401, #403, #404, #406, #407, #408, and #410 Meco Drive, but exclude #402, #405, and #409 Meco Drive (Figure 1). DNREC was tasked to conduct a Sampling Site Inspection (SSI) and a Feasibility Study (FS) of the property to investigate the potential risks posed to public health, welfare and the environment at the Site under the provisions of the Delaware Hazardous Substance Cleanup Act (HSCA), 7 Del. C. Chapter 91. A DNREC contractor, Tetra Tech, Inc., performed the investigation and the FS on the Site.

SITE DESCRIPTION AND HISTORY

As mentioned, the Site consists of seven (7) separate parcels totaling approximately seven (7) acres in New Castle County, Delaware southwest of the City of Wilmington (Figure 2). Meco Drive lies north of Interstate 95 and southeast of Maryland Avenue, immediately west of the Little Mill Creek. The Site is the source of an oily free product in the sub-surface that discharges nearly continuously into a drainage culvert and intermittently into Little Mill Creek.

From 1930 to 1958, Elizabeth Tavani owned the entire Site area. From 1955 to about 1971, various construction companies owned the parcels, including Pullela and Baldini (1955-1971), Ashley Construction (1956-1971), Maykut Construction (1968-1971), and DeSeta/Ates Industries (1971 – 1979). DNREC's contractor, Tetra Tech, discovered that the area was used as a dump in the 1960's. Tetra Tech performed a review of aerial photography that showed various dirt access roads and bare and disturbed soil areas in the 1954 and 1961 photographs. No evidence has been uncovered to link the presence of the subsurface oil with any particular past property owner or business operator.

In December of 1986, a complaint initiated the identification of a seep of oily materials near the vicinity of a drainage pipe on the eastern side of Meco Drive, which was discharging into Little Mill Creek. DNREC-SIRB characterized the seep as intermittent, and DNREC was unable to determine the source of the oil product. In March of 1988, DNREC performed a Preliminary Assessment (PA) of the Site, and recommended that further inspection be performed. In 1990, 1991, and 1992, the DNREC Division of Air and Waste Management's Emergency Response Team, citing the appearance of oil slicks or oily material on the Little Mill Creek in the Site vicinity, completed three (3) Incident Reports. In 1991, DNREC began placing sorbent "boom" materials into the drainage ditch to absorb the oily discharge, and this interim action remains ongoing.

In December of 1998, DNREC tasked their contractor, Tetra Tech, to perform a sampling site investigation (SSI) to attempt to identify the source of the oily free product, to perform the ongoing maintenance of the sorbent boom interim remedy, and to determine whether the Site posed any risks to human health and the environment.

INVESTIGATION RESULTS

Tetra-Tech performed the SSI in the summer and fall of 1999 in order to delineate the source of the LNAPL (light non-aqueous phase liquid). It included the performance of 41 Direct Push test borings, the associated sampling of surface and subsurface soils and the subsequent completion of 36 of the borings as 1"-diameter groundwater monitoring wells. The results of the SSI are summarized below.

Soils

The soil boring program demonstrated the occurrence of two subsurface units in the Site area; (1) an approximately 10-foot thick layer of variable fill materials including granular and fine-grained soils intermingled with asphalt, concrete, angular rock (crusher run), brick fragments, paper products, wood scrap and highly variable amounts of an oily LNAPL product, and (2) underlying the fill was a layer of dark gray organic silt interpreted as geologically recent (Holocene) tidal marsh deposits.

The areal extent of the oily material was delineated; it was encountered in laterally discontinuous locations in 19 of the 41 soil borings. The source of the LNAPL product was determined to likely have been illegal dumping of waste petroleum products into the construction debris fill either before or during the fill placement. No discrete source of petroleum products was identified in the vicinity either by historic records or by Site contaminant distribution.

Laboratory analysis of the soil samples showed high concentrations of the oily product as indicated by analysis of gasoline-range organics (GRO) and diesel-range organics (DRO). Other organic compounds were present only at low levels in a few of the samples, including polychlorinated bi-phenyl (PCB), carcinogenic polynuclear aromatic hydrocarbons (PAHs), and gasoline constituents benzene, ethylbenzene, toluene, and xylenes. The PCBs delineated are in a localized area at a depth of greater than 2 feet below land surface absent of free product-petroleum. The metals analysis did not reveal elevated levels of any of the Target Analyte List metals in the soil samples.

The SIRB chemist performed a "fingerprint" analysis to attempt to identify the chemical constituents of the LNAPL oily product. The product did not match with any of the known petroleum hydrocarbon standards (it was not typical gasoline, heating oil, or diesel fuel, etc.), but the chemist did conclude that the product was aged at least 20 to 30 years and consisted of two separate phases, a lighter mineral spirits or Stoddard Solvent (C9 - C10) mixed in varying proportions with a heavier motor oil or lubricating fluid (C19 – C36). Additional samples of the product were analyzed for Resource Conservation Recovery Act (RCRA) hazardous waste characteristics and for Toxicity

Characteristic Leaching Procedures (TCLP), but the material did not qualify as hazardous based upon the laboratory results.

None of the soil contaminants identified to be present were present at concentrations exceeding DNREC-SIRB's Uniform Risk-Based Standard (URS) concentrations for restricted land uses. Because the Site is (and likely will remain) zoned commercial/industrial, the Site soils do not present risks to human receptors.

The DNREC-SIRB chemist evaluated all the Site data and determined that the solvent in the oily product consists of substituted benzenes, which are listed compounds under HSCA. The presence of this solvent material exacerbates the dissolution of any soluble contaminants present in the soils (including the carcinogenic PAHs) into the groundwater, and permits their migration into nearby surface water bodies where they could pose risks to aquatic receptors.

Groundwater

Thirty-six (36) one-inch diameter wells were installed at the Site in July of 1999, at which time nine wells contained a measurable thickness of LNAPL oil product floating on top of the water table. This number increased over time to 18 wells containing oil product by January 2000. The oil ranged in thickness from just detectable (0.01 inch) to greater than six (6) feet. Surveyed groundwater elevation data showed that the flow of groundwater was radial at the Site, with the highest elevation at the locations of greatest product thickness, decreasing towards the Little Mill Creek and the drainage ditch. The analysis of groundwater samples supported the soil data; very few volatile or semivolatile organic compounds were identified, although high concentrations of oily product (both aromatic and aliphatic hydrocarbons) were present.

Groundwater beneath the Meco Drive Site is not currently used for drinking water. The risk associated with the shallow Site groundwater is related to the discharge of groundwater and the overlying LNAPL product to surface water bodies of the drainage ditch and the Little Mill Creek.

Sediment and Surface Water

In February of 2001, Tetra Tech performed the collection and analysis of four samples of surface water and sediment from the drainage ditch leading to the Little Mill Creek for chemical characterization of the habitat and to evaluate the potential for risks to ecological receptors. Several of the semivolatile PAHs in the soils were present at concentrations above the URS for the Protection of the Environment. The surface water samples did not contain contaminants above action levels.

REMEDIAL ACTION OBJECTIVES

According to HSCA Regulation 8-4(1), remedial action objectives (RAOs) must be established for all plans of remedial action. The Regulations require that DNREC-SIRB set objectives for land use, resource use, and cleanup levels that are protective of human health and environment.

The following RAOs were determined to be appropriate for the Meco Drive site:

- To prevent the current and future human ingestion of groundwater containing contaminants at concentrations above the HSCA risk levels by continuing the use of public water for all purposes at the Site properties and in the surrounding area.
- To prevent environmental impacts to Little Mill Creek, and to the drainage ditch that serves as a tributary to Little Mill Creek, resulting from the offsite migration of LNAPL Site contaminants through subsurface soils on top of the groundwater table.

These objectives are consistent with continued commercial/industrial Site use, and State Regulations governing drinking water supply.

Based upon the RI results and the RAOs, Tetra Tech conducted a focused feasibility study (FFS) for the Site in February of 2002. The FFS evaluated remedial alternatives by which to eliminate the current and future exposures to LNAPL present in subsurface soil and on the groundwater surface at concentrations above regulatory levels. The FFS evaluated several remedial action alternatives, including: (1) no action; (2) a limited action consisting of the continuation of the Interim Remedial Action using sorbent booms and intermittent product pumping from recovery wells; and (3) several containment options using different materials for containing the product, coupled with LNAPL recovery by skimming. DNREC-SIRB and TetraTech discussed the additional alternative of using a containment trench with an Oil/Water Separator. TetraTech evaluated and presented this option to DNREC-SIRB in a FFS Addendum dated August 2004.

ORIGINAL (JANUARY 2005) PROPOSED PLAN OF REMEDIAL ACTION

The FFS evaluation determined that the "Passive Collection Trench with Discharge through an Oil/Water Separator" was the most cost-effective alternative by which to attain the identified Site RAOs. DNREC-SIRB was to have implemented the Remedial Action as described below:

1. The original Final Plan proposed a trench to intercept the down-gradient flow of the LNAPL and contaminated groundwater and divert it prior to its discharge into the existing drainage swale. Oily soil removed from the trench excavation was to be disposed at an offsite, permitted facility. The trench would have housed a 24"-diameter perforated corrugated pipe and be backfilled with clean crushed stone. The LNAPL and groundwater collected within the trench would have been gravity-feed to a terminal Oil/Water Separator. After treatment, the water was to have flowed to a permitted discharge point at the terminus of the drainage ditch prior to its confluence with Little Mill Creek.
2. A written deed restriction would have been placed upon the deeds of the Site properties within 90 days following DNREC's adoption of the Final Plan of Remedial Action. The deed restriction would have prohibited all land disturbing activities (including, but not

limited to, digging, drilling, and excavating) on the property without the prior written approval of the DNREC SIRB to limit exposure to contaminants at depth. In addition, the deed notation would have limited future Site use to a restricted (commercial or industrial) land use to maintain the assumptions of the Human Health Risk Assessment, (which is also in accordance with current zoning).

3. DNREC staff incorrectly assumed that the Meco Drive site was included within the City of Wilmington's groundwater management zone (GMZ), which is an internal DNREC document restricting the use of groundwater in the City. This would have prohibited the installation of any water well on, or use of groundwater at, the site without the prior written approval of DNREC. Deed restrictions would have been placed upon the deeds of the Site properties within ninety-days (90) following DNREC's adoption of the Final Plan., as well as having noted that the Site is located within a GMZ.

AMENDED FINAL PLAN OF REMEDIAL ACTION

The FFS evaluation determined that the "Passive Collection Trench with Discharge through an Oil/Water Separator" was the most cost-effective alternative by which to attain the identified Site RAOs. The method of removal of the treated water from the Site has changed.

DNREC-SIRB will achieve the RAOs for the Site through creation of two Operating Units (OUs). OU-1 is the implementation of the Passive Collection Trench with Discharge through an Oil/Water Separator. This remedy will remove the flow of LNAPL contaminated groundwater prior to discharge to the drainage swale and Little Mill Creek. OU-2 is the continued delineation of contamination in the soil, groundwater and sediment at the Site and the development of a remedy to address these contaminants. Once that delineation is complete, DNREC-SIRB will draft the Proposed Plan for Meco Drive OU-2.

The Remedial Action for OU-1 will occur as described below:

1. The excavation of a trench to intercept and divert the down gradient flow of the LNAPL and contaminated groundwater prior to its discharge into the existing drainage swale will occur. Oily soil removed from the trench excavation shall be disposed at an offsite, permitted facility. The trench will house a 24"-diameter perforated corrugated pipe, and will be backfilled with clean crushed stone. The LNAPL and groundwater collected within the trench will gravity-feed to a terminal Oil/Water Separator. In the January 2005 Final Plan (herein amended) treated water was to flow to a permitted discharge point at the terminus of the drainage ditch prior to it's confluence with Little Mill Creek. Due to State of Delaware Surface Water Discharge regulatory constraints placed on treated discharge water, this option is cost prohibitive within the scope of the HSCA Regulations. Treated water will now be routed via force main pipe to the New Castle County sewer system for removal from the Site.
2. An Environmental Covenant, consistent with the requirements of the July 2005 Uniform Environmental Covenants Act (UECA), 7 Del. C. Chapter 79, Subchapter II shall be placed upon the deeds of the Site properties within 90 days following DNREC's adoption of the Final Plan. The Environmental Covenant will prohibit all land disturbing activities (including, but not limited to, digging, drilling, and excavating) on the property without the prior written approval of DNREC SIRB. In addition, the covenant will limit future

Site use to a restricted (commercial or industrial) land use to maintain the assumptions of the Human Health Risk Assessment, (which is also in accordance with current zoning).

3. Upon further review of the location of the Site, DNREC-SIRB determined that the City of Wilmington Groundwater Management Zone (GMZ) does not overlay the Site. Groundwater beneath the Meco Drive site is not extracted for drinking water. The risk associated with the shallow Site groundwater are related to the discharge of groundwater and the overlying LNAPL product to surface water bodies of the drainage ditch and the Little Mill Creek. DNREC-SIRB proposes the Southwest Wilmington GMZ for the Site (and others inclusive) to prevent the use of the shallow groundwater.

James D. Werner
Director, Division of Air and Waste Management

20 Sept 2006
Date of Review

PUBLIC PARTICIPATION

The Department actively solicited written public comments and suggestions on the Amended Proposed Plan of Remedial Action. The comment period began August 28, 2006, and ended at the close of business (4:30 pm) September 11, 2006. DNREC received no public comments for the Amended Final Plan of Remedial Action for Meco Drive (OU-1) during the public participation phase.

Declaration

The Final Plan of Remedial Action for the Meco Drive (OU-1) Site is protective of human health, welfare and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

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Figure 1: Site Location

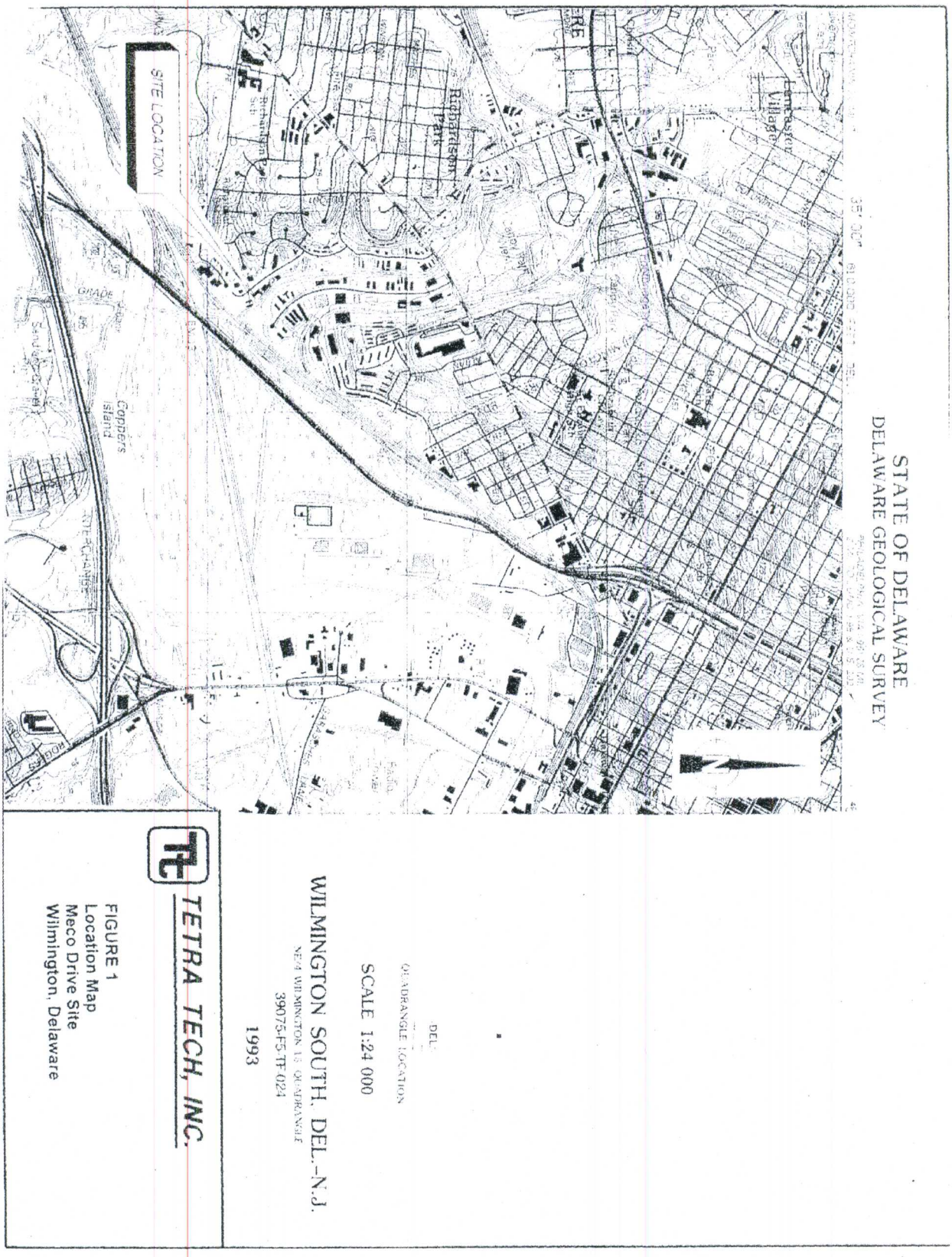
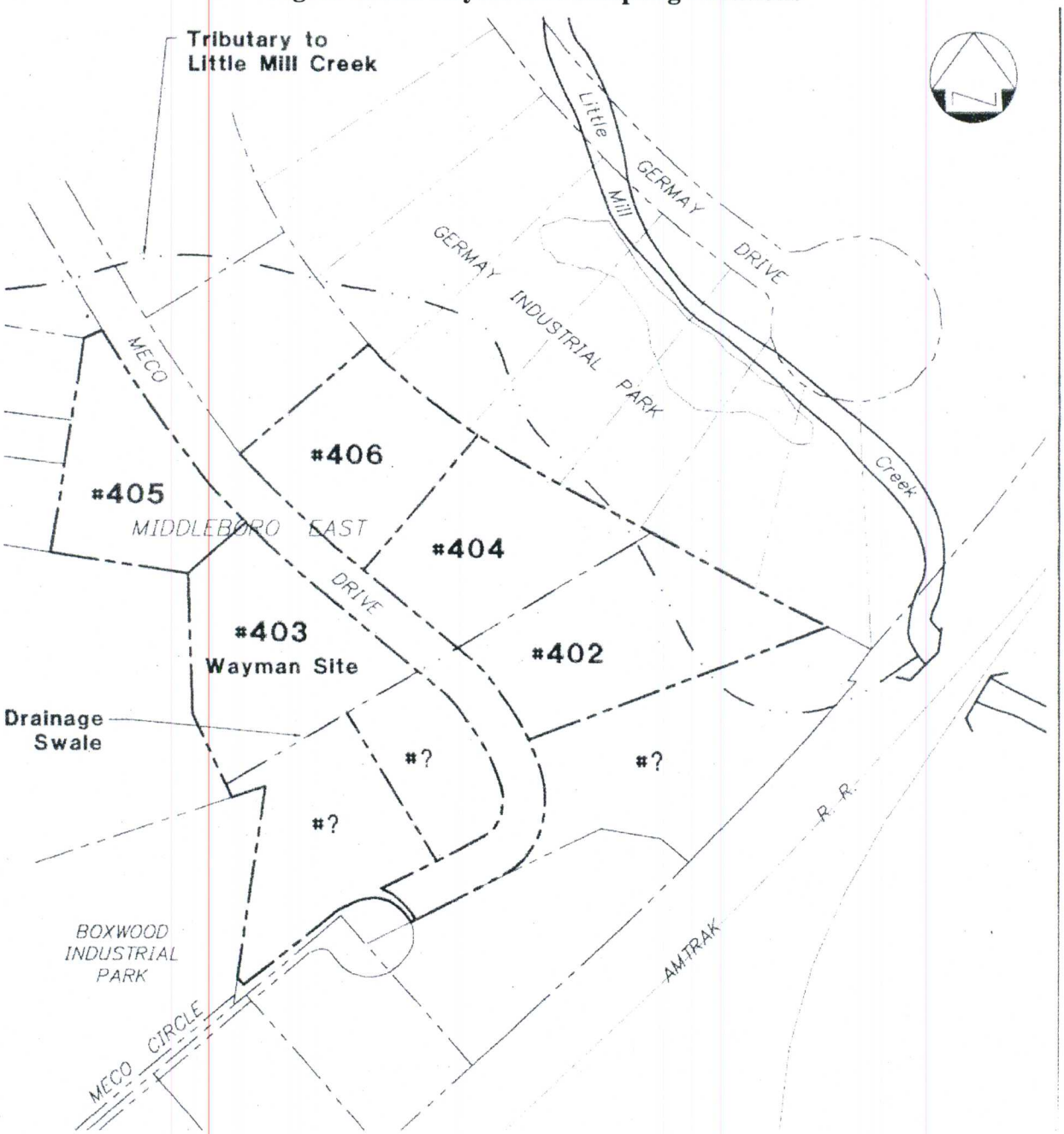
Figure 2: Site Layout and Sampling Locations