Appendix F

# PHASE II WORKPLAN

for

# ATLANTIC STEEL INDUSTRIES, INC. PROPERTY

**Atlanta, Georgia**

August 15, 1997

# TABLE OF CONTENTS

**TABLE OF CONTENTS-Continued**

## Figures



## Appendices

# 1.0 INTRODUCTION

## 1.1 PROJECT BACKGROUND

Law Engineering and Environmental Services, Inc. (LAW) has prepared this *Phase II Workplan* for the Atlantic Steel property in Atlanta, Georgia. LAW has prepared this *Phase II Workplan* in connection with a proposed transaction involving the property, under a contract between Atlantic Steel Industries, Inc. (the current owner) and Atlantis 16th, L.L.C. (the potential purchaser).

This *Phase II Workplan* includes a description of LAW's non-invasive Phase I assessment of the property, existing data and background information (hereinafter "Phase I Assessment"). The Phase I Assessment concludes upon issuance of a final *Phase II Workplan.*

This *Phase II Workplan* presents the general objectives and specific scope of work for upcoming investigative activities (hereinafter "Phase II Investigation"). This *Phase II Workplan* contains the following sections:

- a description of current conditions at the property (including site history, operations, and permit issues)
- a description of the conceptual approach to performing the Phase II Investigation
- detailed strategies and procedures for investigating the facility environmental setting, potential migration pathways and receptors, and potential (suspected) contaminant releases
- risk assessment methodologies
- quality assurance/quality control, and sampling and analysis procedures (Appendix A)
- data management and reporting procedures
- a summary schedule for implementation of this plan

## 1.2 THE PHASE I ASSESSMENT

LAW initially performed and has completed a non-invasive assessment of environmental conditions at the property. The objectives of this Phase I Assessment were to:

- Identify potentially impacted areas (PIAs) of the property where known or suspected activities may have resulted in soil or groundwater contamination.
- Prepare a report and *Phase II Workplan* that describes the Phase I Assessment results and proposes Phase II investigation activities.

The Phase I Assessment was performed in general accordance with the ASTM *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Standard E1527),* modified as appropriate based on engineering judgment to account for the nature of site operations and the availability of existing environmental information. The Phase I Assessment consisted of reviewing existing environmental reports for the property, reviewing historical records, performing a property and property area reconnaissance, conducting interviews with cognizant Atlantic Steel personnel, and preparing this report/workplan.

LAW performed a reconnaissance of the property and interviewed Atlantic Steel personnel regarding past and present operations over the period beginning June 4 and continuing through June 11, 1997. The primary source of interview information was Mr. Neil A. Harmon, Principal Environmental Engineer, representing Atlantic Steel. LAW also sent a written environmental-related questionnaire to each current occupant of the residential properties which are part of the proposed transaction. The questionnaires were completed, returned to LAW, and reviewed for environmental significance (e.g., as evidenced by underground heating oil tanks, substantial releases of oil from automobiles, or "industrial" type uses of the properties). LAW conducted a verbal interview with one occupant and toured one residence.

LAW reviewed available historical information for the property to assess prior land use, as identified below:

- Aerial photographs dating to the early 1900s
- Property-related drawings dating to the early 1900s (e.g., sewer plan drawings, site plans, location of outparcels owned by Atlantic Steel, property-specific topographic map)
- U.S. Geological Survey 7.5-minute Topographic Quadrangle Map of Northwest Atlanta, Georgia (dated 1993)
- Sanborn Fire Insurance Maps dated 1911, 1950, and 1978
- Existing environmental-related information, which generally included a RCRA post-closure permit and permit application, RCRA Facility Investigation workplan, historical groundwater monitoring data, soil and groundwater assessment data, waste stream characterization information, operations process flow charts, Hazardous Waste Disposal Reports for various years, permits (air, solid waste, storm water, and wastewater), aboveground and underground tank information, and spill-related reports and remediation documentation.

## 1.3 THE *PHASE II WORKPLAN*

This *Phase II Workplan* has been developed to assess the nature and extent of environmental concerns at the property in anticipation of the proposed transaction and future property redevelopment. This *Phase II Workplan* presents a multi-phased, multi-media approach designed to:

- characterize the nature of groundwater flow in the area
- characterize the present "baseline" concentrations of specific constituents in surficial and sub-surficial in-situ materials (e.g., fill, soil), and evaluate the potential human health and ecological risk associated with these constituents
- characterize the profile of fill materials (e.g., slag, non-native soils, construction debris, railroad track ballast) based on the sampling grid and other pertinent sampling activities
- characterize the nature of known and suspected releases to air, soil, groundwater, and surface water at PIAs identified during the Phase I Assessment, and evaluate the human health and ecological risk associated with releases

It is anticipated that the Phase II Investigation may be an iterative process, and this Workplan describes the first iteration. Subsequent soil, sediment, or groundwater sampling may be necessary to fill data gaps or gather supplemental data based on the results of this first iteration. As examples, the results of the first iteration of groundwater monitoring in 8 overburden wells will be used to establish the location and analytical parameters for a bedrock groundwater monitoring well, and the results of the analyses of the ten samples collected from sub-surficial materials using a grid pattern will be used to establish the analytical suite to be applied to the remaining grid samples.

The overall Phase II Investigation activities will include:

1) Installing groundwater piezometers and groundwater quality monitoring wells; measuring groundwater characteristics in the piezometers; sampling and analyzing groundwater from the groundwater quality monitoring wells; and developing a groundwater potentiometric surface map (described in detail in Section 4.1)
2) Sampling and analyzing surficial and sub-surficial, in-situ materials to profile the concentrations of selected constituents in those materials (described in detail in Section 4.2)
3) Drilling soil borings as necessary to prepare a topographic map describing the vertical and horizontal presence of fill materials (described in Section 4.2)
4) Sampling and analyzing soils and/or sediments in discrete PIAs (described in detail in Section 4.3)
5) Evaluating the data from activities 1) through 4) to :

- Evaluate the presence and concentration of contaminants in the soil, sediment, and groundwater
- Assess human health and ecological risk for intended property uses
- Establish the direction for remediation activities, as necessary, based on future uses and the results of the human health and ecological risk assessment

## 1.4 OUTCOMES OF THE PHASE II INVESTIGATION

Upon completion of the investigation described in this *Phase II Workplan*, sufficient information will be available to:

- understand the nature of groundwater flow beneath the property to aid in the development of engineering and institutional controls, if necessary
- distinguish areas of environmental impact requiring remediation or exposure controls from those for which no further action is required
- develop a *Phase II Report and Remediation Plan* that addresses areas of environmental impact requiring remediation or exposure controls

# 2.0 DESCRIPTION OF CURRENT CONDITIONS

## 2.1 FACILITY DESCRIPTION

The Atlantic Steel facility is located on Mecaslin Street in Atlanta, Georgia, as indicated in Figure 1. The property, as that term is used in this workplan, actually is made up of a number of parcels of land:

- The 130-acre parcel that includes all former steel-making and manufacturing operations
- A 1.7-acre parcel that is occupied by Tri Chem Corporation
- 43 outparcels located in the area southeast of Sixteenth Street and Mecaslin Street, and now used for either vehicle parking or single-family dwellings. The outparcels range in size from 0.07 acres to 1.61 acres.

## 2.2 OPERATIONAL HISTORY AND PERMITS

Atlantic Steel began steel and iron working operations in the early 1900's. Prior to that, the land on which the Atlantic Steel facility, the Tri Chem facility, and the outparcels exist was undeveloped.

In its present configuration (Figure 2), the plant made finished steel from scrap that was melted, rolled and drawn into steel merchant bar, wire rod, and wire products. Steel billets from the steelmaking operation were also reheated in furnaces and rolled into finished products such as merchant bar and wire rod. Selected product runs of wire rod were acid pickled in sulfuric acid (rod cleaning) and lime coated in preparation for wire drawing. Other products were galvanized for durability.

The property currently maintains permits for solid waste disposal, wastewater pretreatment discharges, air emissions, and post-closure care of a former hazardous waste dust pile (described below).

Process water has always been delivered to the plant from the city via one of several holding ponds on the property. One pond has been closed, the other two remain active. Contact and non-contact cooling water was regularly channeled from the production areas and discharged to the ponds. Stormwater and sanitary wastewater have always been discharged to the City of Atlanta sewer system.

Steel making was converted from open hearth furnace to electric arc furnace (EAF) in 1953, when Atlantic Steel purchased an inactive foundry operation (Southern Iron and Equipment Co.) located at the current western portion of the property. EAF operations were discontinued in 1991. The wire drawing operation was closed in 1995 and the rod cleaning operation was permanently shut down in 1996.

Galvanizing operations ceased in 1993. Only steel rolling in the Rod Mill and 13" Mill currently remains active at the property.

The former steelmaking operation used four dust collectors for capturing air emissions. The dust collected from the EAF was listed as a hazardous waste (K061) under the provisions of RCRA.

For a number of years, Atlantic Steel accumulated (for off-site recycling) EAF dust on the ground in a specified pile area at the western end of the direct evacuation dust collector. Following the closure of the former waste pile, Atlantic Steel installed a silo for temporary storage of the dust generated until it could be shipped to an off-site recycling facility.

After closure of the EAF steel-making operation in 1991, Atlantic Steel removed all remaining dust from the dust collectors and the storage silo. The unit is regulated under a RCRA Post-Closure Permit, and groundwater in the area is being monitored using 15 active groundwater monitoring wells, and withdrawn using a groundwater recovery system that discharges to the City of Atlanta sewer.

One noteworthy past support operation at the plant was the manufacturing of fuel (gas) from coal. This operation took place until approximately 1930, when use of natural gas as the primary fuel began. It is believed by plant personnel that the coal gasification took place in up to three buildings (shown on Figure 2), all of which remain in place but have subsequently been used for other plant operations.

The steel manufacturing process requires the substantial use of contact cooling water. In the process, the contact cooling water is impacted by scale, the primary constituents of which are base metals and heavy petroleum fractions. Historically, the contact cooling water has been discharged to in-ground pits or surface impoundments, where physical settling of the solids occurred, and from which the supernatant would be discharged and recycled into process water supply ponds on site. The western ponds were periodically dredged of the settled mill scale and deposited in several areas on site.

In the past, Atlantic Steel has deposited solid waste on the property, most notably at its eastern end. The area in which the solid waste was routinely deposited has since been sold to the Georgia DOT and developed as interstate and substantial excavation occurred during this construction; consequently, the

solid waste deposition areas no longer exist. In addition, the City of Atlanta performed removal operations in that area (1995 to 1996) during reconstruction of the Orme Street sewer.

The Tri Chem facility has been used for manufacturing for at least 40 years. Operations have included recycling EAF dust into fertilizer, and manufacturing of burial vaults.

The outparcels have been used either for vehicle parking and/or residential uses. Based on the survey of current occupants, no environmental issues are known or suspected to exist at any outparcel. Consequently, no Phase II Investigation activities are proposed for the outparcels. It may be appropriate, however, to locate groundwater piezometers on selected outparcels.

## 2.3 SUMMARY OF PRIOR ASSESSMENT

The following chronology of documents and reports present a summary of significant monitoring, assessment, and corrective action activities at the facility. Most RCRA activities cited relate to the former K061 dust pile at the western end of the property. Other, PIA-specific assessment results are discussed in Section 4.3.

| | | |
|---|---|---|
| November 8, 1985 | — | Initial submittal of the Part B - Closure and Post-Closure Permit Application (for former K061 Waste Pile) |
| May 8, 1986 | — | Revision 1 to the Part B Application |
| February 6, 1987 | — | Groundwater Quality Assessment Report (rate and extent of hazardous constituents in groundwater from former Waste Pile) |
| June 29, 1987 | — | Issuance of Permit No. HW - 044(D) by Georgia Department of Natural Resources Environmental Protection Division (GA EPD) and approval of Closure Plan in Part B Permit Application |
| March 3, 1987 | — | Corrective Action Plan for Ground Water |
| September 25, 1987 | — | RCRA Facility Investigation Plan (indicating the former container storage area required further assessment) |
| October 15, 1987 | — | Closure Certification for Former Waste Pile |
| January 15, 1988 to January 14, 1997 | — | Semi-Annual Corrective Action Reports (for former Waste Pile) |
| July 29, 1988 | — | Phase II Contamination Assessment Report for Former Container Storage Area (showing no further action required) |
| September 30, 1988 | — | Groundwater Recovery System Installation and Start-Up Report |

| | | |
|---|---|---|
| September 8, 1989 | — | Groundwater Sampling and Analysis Plan |
| September 28, 1992 | — | Amendment to Hazardous Waste Facility Permit No. HW-044(D) |
| October 28, 1992 | — | Revision 2 to Part B Application |
| March 11, 1993 | — | Revision 3 to Part B Application |
| November 11, 1994 | — | Third Quarter Analytical Results |
| July 24, 1995 | — | Report for Lateral (Side-Gradient) Groundwater Quality Assessment (for former Waste Pile) |
| July 17, 1996 | — | Cleaning House Preliminary Contamination Assessment Plan |
| August 8, 1996 | — | Atlantic Steel Application for Class 3 Permit Modification and Revision 4 to Part B Application |
| September 30, 1996 | — | Amendment to Hazardous Waste Facility Permit No. HW-044(D) |
| January 14, 1997 | — | Most recent Semi-Annual Corrective Action Report (for former Waste Pile) |
| March 13, 1997 | — | Application for Renewal of Hazardous Waste Facility Permit No. HW-044(D) |
| July 2, 1997 | — | Consent Order regarding the extension of terms and conditions for Hazardous Waste Facility Permit |

In addition, a survey to identify drinking water wells in the site area was performed in 1997. The survey included reviewing U.S. Geologic Survey records and Georgia Geological Survey Information Circular 63; conducting telephone interviews with owners of wells and with government agencies (e.g., county public works administration and health department); and on-site observations of wells for which other conclusive information was not available. The results of the survey indicate that no drinking water wells exist within a three-mile radius of the property.

### 2.3.1 Geology and Hydrogeology

The geology and hydrogeology of the Atlantic Steel property are discussed below, and are based on data obtained from the studies listed above and from published geologic literature.

The property is located in the Piedmont Physiographic Province. The Piedmont Province parallels the eastern edge of the North American continent south of New England and east of the Blue Ridge Province. The Piedmont is the non-mountainous part of the Appalachians, and general slope is from the mountains toward the Coastal Plain. The northwestern, or inner, boundary of the Piedmont is at the foot

of the mountains, and the southeastern, or outer, boundary (known as the Fall Line) occurs where older, crystalline rocks of the Piedmont pass beneath the Cretaceous and younger sediments of the Coastal Plain.

Typical Piedmont landscape is a rolling surface of gentle slope, cut or bounded by valleys of steeper slope and greater depth, often several hundred feet deep. The Southern Section of the Piedmont Province in Georgia and Alabama differs in altitude, extent of erosion, and relative abundance of monadnocks from the rest of the Piedmont Province (Fenneman, 1938). The rolling areas are largest in the Southern Section, especially in Georgia, where such topography is dominant and deep valleys are relatively rare. Similar areas to the north are smaller in area.

In Georgia, the Southern Section of the Piedmont consists of the Upland Georgia Subsection and the Midland Georgia Subsection. The Atlantic Steel property is located in the Gainesville Ridges District of the Upland Georgia Subsection. The Gainesville Ridges occur along the border of the Upland Georgia Subsection and the Midland Georgia Subsection, and consist of a series of northeast-trending, low, linear, parallel ridges separated by narrow valleys (Clark and Zisa, 1976). The courses of the Chattahoochee River and its tributaries are strongly controlled by the ridges in the district, and exhibit a rectangular drainage pattern.

The Atlantic Steel property occupies a narrow, east-sloping valley, typical of the surrounding portion of the Gainesville Ridges District. At the eastern property boundary near Interstate Highway I-75/I-85, the valley turns abruptly to the north. The valley floor ranges in elevation from about 865 feet above mean sea level (msl) at its outlet, to about 915 feet at the upslope, western end. Surrounding ridge tops reach off-site elevations of approximately 1,000 feet msl. Surface runoff from most of the site flows to the east, with discharge at the northeast property corner to an unnamed, north-flowing tributary to Peachtree Creek, a west-flowing tributary to the Chattahoochee River. The rectangular drainage pattern of the unnamed, north-flowing tributary, Peachtree Creek and the Chattahoochee River is typical of the Gainesville Ridges District.

Streams exhibiting rectangular drainage patterns flow in strongly angular courses that follow the rectangular pattern of brittle structures (e.g., joints and fractures) in the underlying bedrock (Cressler, Thurmond and Hester, 1983). Such streams show the influence of geologic control, and their drainage

style reflects the different lithologies present, the geologic structure, and the hydrogeology of the underlying bedrock. Therefore, in order to understand the pattern of surface-water flow and to characterize surface water/groundwater interaction, the geologic structure and native lithologies need to be identified.

The property is located along the northwest flank of the Newnan-Tucker synform, a down-folded bedrock structure that contains much of the greater Atlanta region. From closure to closure, the synform is more than 56 miles long and more than 25 miles wide at its widest point (Higgins and Atkins, 1981). The synform has been locally modified by several generations of later folds. Near the Atlantic Steel property, bedrock units on the northwest flank of the Newnan-Tucker synform area are (from northwest to southeast) the Norcross Gneiss, the Clairmont Formation and the Wahoo Creek Formation (McConnell and Abrams, 1984).

The Atlantic Steel property is underlain by Late Precambrian to Early Paleozoic bedrock of the Clairmont Formation. The Clairmont Formation was named by Higgins and Atkins (1981) for exposures around the intersection of Clairmont Road and Interstate 85 in Dekalb County. Typically, the Clairmont is a well-foliated, medium-grained, locally scaly, light- to dark-gray biotite-plagioclase gneiss intimately interlayered with fine- to medium-grained hornblende-plagioclase amphibolite (Higgins and Atkins, 1981). Locally, amphibolite makes up entire outcrop areas with little or no gneiss present, while other areas have only sparse amphibolite and consist of thinly banded gneiss. Epidote and garnet are locally present as accessory minerals in the gneiss. The gneiss generally has thin bluish-gray bands alternating with whitish-gray bands and with amphibolite. The layering is on the order of a few centimeters and commonly is very distorted. Even in saprolite outcrops, the distinctive, finely banded character of the Clairmont is preserved. On further weathering, the Clairmont forms a dark-red soil containing ocherous bands derived from the amphibolite. The Clairmont Formation was interpreted by Higgins et al. (1988) to be the preserved remnants of a subduction melange, based on the variety of clast lithologies in the Clairmont and its extremely complex deformational history.

The Clairmont Formation is bordered on the northwest by the Norcross Gneiss, a well-foliated, light-gray, epidote-biotite-muscovite-plagioclase gneiss (Higgins and Atkins, 1981). To the southeast, the Clairmont Formation is bordered by the Wahoo Creek Formation, a distinctively slabby, nearly white, fine- to medium-grained muscovite-plagioclase-quartz gneiss (Higgins and Atkins, 1981).

No evidence from previous mapping suggests the local existence of major folds or faults in the bedrock units in the site area. However, brittle structures, such as joints and fractures, generally oriented at high angles, often overprint earlier structural features within the Atlanta region, and may exist within the bedrock beneath the property.

Because original grain boundaries and pore-space relationships within rocks of the Atlanta area have been altered through metamorphic recrystallization, permeability of the Clairmont Formation bedrock is relatively low. However, groundwater in the greater Atlanta region occupies joints, fractures and other secondary openings in bedrock, and occupies pore spaces in the overlying mantle of residual material (Cressler, Thurmond and Hester, 1983). Brittle structures (e.g., fractures and joints) extend through the bedrock in intersecting patterns. At shallow levels, these structures may act as conduits for groundwater circulation beneath the mantle of residual material.

Former process-water supply wells have been identified at the Atlantic Steel property (Cressler, Thurmond and Hester, 1983). The wells ranged in depth from 350 to 508 feet, and yields ranged from 70 to 130 gallons per minute (gpm). The Atlantic Steel property is located in Hydrologic Unit D of Cressler, Thurmond and Hester (1983). In Hydrologic Unit D, the greatest well yields are encountered where the following conditions occur:

- small-scale structures localize drainage development
- contact zones exist between rocks of contrasting character
- favorable topographic conditions and soil thickness occur
- fault zones are present
- stress-relief fractures are present.

Contact zones between rocks of contrasting character and fault zones are not known to occur in the site area. The criteria listed by Cressler, Thurmond and Hester (1983) to identify stress-relief fractures are not present in the area. However, the narrow, east-sloping valley occupied by the Atlantic Steel property may be the result of small-scale structures that localize drainage development, and, in turn, create favorable topographic conditions for well yield. Therefore, the yield of the former process-water supply

wells at the Atlantic Steel property may be the result of the small-scale brittle structures (e.g., joints and fractures) that created the narrow, east-sloping valley.

Groundwater recharge to the fractured bedrock occurs through seepage of precipitation through the overlying mantle of residual material, or by flowing directly into openings in the exposed rock (outcrops). Depth to bedrock and thickness of the overlying residual material varies in the area. Thin soil intervals above the Clairmont Formation may be observed in outcrop near the northern end of Spring Street, at Brookwood interchange, along Northside Drive, and in the type locality around the intersection of Clairmont Road and Interstate 85 in Dekalb County. However, deep weathering (30 to 80 feet) of the Clairmont Formation has also been observed.

Groundwater beneath the Atlantic Steel property occurs under water-table conditions. The water-table surface is generally a subdued replica of the topographic surface. Therefore, groundwater is expected to flow inward to the valley where the property is located and from west to east beneath the property along the valley slope. Groundwater discharge is expected to occur to creeks or impoundments that lie in topographically low areas. Groundwater beneath the property would either discharge to these topographically low surface-water bodies, or exit the site at the northeast property corner. There are no obvious variations in on-site geologic conditions that would cause changes to the groundwater flow directions in the area. Monitoring of the groundwater aquifer at the western end of the property has been ongoing since 1987. Based on the monitoring, groundwater in this area flows in a southeasterly direction toward the ponds and sedimentation basins at a rate of approximately 70 feet per year.

However, a six-foot diameter combined sewer main occupying the course of a former natural drainage ditch along the length of the valley is expected to influence local groundwater flow direction and to act as a conduit for groundwater migration. North of the sewer, groundwater is expected to locally flow in a southeasterly direction, and south of the sewer, groundwater is expected to locally flow in a northeasterly direction. Discharge of site groundwater may occur to the sewer, or groundwater may leave the site through the backfill material around the sewer.

In water-table aquifers, groundwater discharge areas are usually located in topographical lows where the water table is located close to or at the land surface (Fetter, 1988). The narrow, east-sloping valley

occupied by the Atlantic Steel facility is one such discharge area. In discharge areas, the vertical hydraulic gradient is upward; that is, groundwater flows from areas of greater depth to the discharge points at shallow depth. Therefore, groundwater in the brittle structures (e.g., fractures and joints) and in the overlying mantle of residual material flows to the discharge areas identified above (i.e., the creeks or impoundments that lie in topographically low areas and the northeast property corner). Recharge of groundwater beneath the Atlantic Steel property to the regional system of joints and fractures in the Clairmont Formation is not likely to occur.

## REFERENCES

Clark, W.Z., Jr., and A.C. Zisa, 1976, Physiographic map of Georgia, scale 1:2,000,000; Georgia Geologic Survey Map SM-4

Cressler, C.W., C.J. Thurmond, and W.G. Hester, 1983, Groundwater in the greater Atlanta region, Georgia; Georgia Geologic Survey Information Circular 63

Fenneman, N.M., 1938, Physiography of the eastern United States; McGraw-Hill Book Company, Inc., New York and London

Fetter, C.W., Applied hydrogeology, second edition; Macmillan Publishing Company, New York

Higgins, M.W., and R.L. Atkins, 1981, The stratigraphy of the Piedmont southeast of the Brevard zone in the Atlanta, Georgia area, *in* Latest thinking on the stratigraphy of selected areas in Georgia: Georgia Geologic Survey Information Circular 54-A

Higgins, M.W., R.L. Atkins, T.J. Crawford, R.F. Crawford, R. Brooks, and R.B. Cook, 1988, The structure, stratigraphy, tectonostratigraphy, and evolution of the southernmost part of the Appalachian orogen; US Geological Survey Professional Paper 1475

McConnell, K.I., and C.E. Abrams, 1984, Geology of the greater Atlanta region; Georgia Geologic Survey Bulletin 96

# 3.0 PHASE II INVESTIGATION APPROACH

## 3.1 PURPOSE / OBJECTIVES

The purpose of this Phase II Investigation is to investigate site groundwater, conduct a baseline contamination assessment of surficial and sub-surficial materials, and further investigate PIAs identified in the Phase I activities. These investigations will include sampling and analysis of soils, fill materials, sediments, and groundwater to understand the environmental setting of the property. Potential human and ecological receptors will be identified, and the generated data will be used to conduct a risk assessment to establish subsequent remedial activities and control measures that may be necessary to support the intended future development and use of the property.

## 3.2 TECHNICAL APPROACH

The technical approach for this Phase II Investigation is that of a phased and potentially iterative investigation, with each phase of the investigation building upon previous phases, as appropriate. Media investigated will include soil, sediment, fill materials and groundwater.

This *Phase II Workplan* sets out an approach to complete an investigation of the environmental setting of the facility, investigate potential contaminant-migration pathways and receptors, initiate contamination identification activities for each PIA identified, and provide a baseline contamination assessment across the property. Additional phases of investigation will be performed at any PIAs where data generated during this investigation supports further investigations, and at any new PIAs identified as a result of this investigation.

A contaminant-focused approach will be used for the groundwater investigation, baseline assessment of in-situ materials, and each PIA investigation area. The analytical suite chosen is based on those constituents that are expected to be present based on historical operations, chemical usage, and analytical results from previous investigations. The multi-media approach justifies this focused strategy.

Each specific PIA will be identified in the following section, along with the investigative strategy to be utilized for each area. The investigative strategies for groundwater and the baseline assessment of surficial materials will also be discussed in detail in the following section.

## 3.3 ALTERNATE DELINEATION APPROACH

### Introduction

The Atlantic Steel property is to be rehabilitated and fully redeveloped for multi-unit residential, office, hotel, entertainment and retail trade uses. The rehabilitation program consists of four parts: (1) property-wide assessment of contamination; (2) evaluation of potential health or environmental risks posed by such contamination; (3) selection of appropriate remedies; and (4) implementation of the remediation activities necessary to protect public health and the environment consistent with future uses of the property.

As a regulated industrial facility, activities on the Atlantic Steel property have long been subject to various environmental regulations administered by the Georgia Environmental Protection Division (EPD). This regulation includes a Resource Conservation Recovery Act (RCRA) post-closure permit for a former furnace dust (hazardous waste) handling unit. Because the Atlantic Steel facility is already subject to the RCRA regulatory program, the planned rehabilitation will also be consistant with RCRA corrective action requirements as administered by EPD. In particular, the requirements for assessment of contamination, evaluation of potential risks and remediation activities will be established consistent with the November 1996 *Georgia EPD Guidance For Selecting Media Remediation Levels at RCRA SWMUs* ("SWMU Guidance").

Timing is a critical factor for successful redevelopment of the property. Commitments for redevelopment are contingent on a six-month period for completion of contamination assessment, risk evaluation and establishment of specific remediation requirements and associated cost estimates. If the redevelopment is to proceed, timely review and approval of this work plan is essential. With limited time available for investigations, it is necessary to schedule and conduct some elements of the investigation in parallel with limited opportunity for iterative approaches.

The contamination assessment portion of the overall property rehabilitation program includes detailed sampling and laboratory analyses to determine what specific contaminants are present in soil and ground-

water and to delineate how far contamination may have spread across the property. The resulting data will be used to evaluate the potential for risks to human health and the environment and to establish specific remediation requirements consistent with redevelopment and future use of the property.

EPD ordinarily requires that soil and groundwater contaminant plumes for SWMUs be delineated to background/detection limit concentrations. In most instances such delineation involves an iterative process of stepwise sampling, outward from each SWMU, until background/detection limit concentrations are confirmed in all directions. EPD considers the "sample to background" regimen a useful generic approach so as not to underestimate the extent of a SWMU contaminate plume on a property. The objective is to first define the SWMU plume extent relative to background concentrations and then to determine which portion of the plume may exceed potential exposure limits for protection of public health or sensitive ecological systems.

Difficulties with the sample-to-background approach are that it presupposes the need to establish background distributions and the ability to distinguish non-regulated human-caused contamination from those SWMU releases that are subject to RCRA corrective action requirements. In congested urban areas it is often impossible to reliably determine background concentrations especially for metals and fuel combustion products. This is because normal human activities such as transportation, fuel burning and historic commercial, residential and industrial property uses have contributed to the area background. In congested urban areas, such as the Atlantic Steel industrial area, contaminant concentrations elevated above naturally occurring background are not solely the result of releases from SWMUs.

A SWMU-by-SWMU approach to delineation for the Atlantic Steel property would not adequately characterize the entire property for redevelopment and could leave substantial information gaps because not all contamination present is necessarily associated with SWMUs. A comprehensive property-wide approach to contaminant characterization and delineation is needed; an approach that will quickly provide a reliable understanding of those environmental factors which might affect the results of a risk evaluation considering redevelopment and specific future uses of the property. Fortunately, EPD's SWMU guidance recognizes that under certain well-defined site-specific circumstances an alternate delineation (AD) approach may be warranted. The EPD guidance outlines both general concepts and media-specific factors to be considered for AD proposals.

**Unique Property Setting and Features**

An AD approach is embodied in the Phase II Workplan for the Atlantic Steel property. This AD approach is highly specific to the Atlantic Steel setting and is based upon a number of unique natural and man-made site conditions and features which warrant application of this approach, including the following:

1. Piedmont Bedrock Location - The property is located in the Piedmont Physiographic Providence and is underlain by the Clairmont Formation bedrock. There is no evidence from previous mapping of the local existence of major folds or faults in the bedrock in the property area.

2. Property Situated in Well-Defined Narrow Valley - The property lays within a narrow, west-to-east sloping valley. The valley floor elevations range from about 915 feet above mean sea level (msl) at the western end of the property to about 865 feet at the down slope (eastern) property boundary. The surrounding ridge tops reach off-property elevations of approximately 1000 feet msl. At the eastern property boundary the valley turns abruptly to the north along Interstate Highway I-75/I-85.

3. Area Drainage Naturally Converges Into The Property - As a result of the natural valley setting, drainage from the surrounding area converges into the Atlantic Steel property. This means that contaminant releases to soil on the Atlantic Steel property would not impact upgradient (offsite) properties. This natural control feature limits the consideration of potential off site delineation to the downslope property boundary along the I-75/I-85 highway corridor that acts as an exposure-limiting control boundary.

4. Property and Area Groundwater Is Not A Potential Source of Drinking Water - Based upon a recent Law Engineering and Environmental Services well survey of the surrounding area (3 mile radius from the property) there are no wells used for drinking water purposes in the area. This is consistent with the fact that this highly developed area has long been served by the municipal water distribution system. Considering the high density development in the surrounding urban area it would not be prudent sanitary practice to directly use the water table aquifer for drinking

water due to the inherent potential for leaky sewers and urban non-point sources of bacterial and chemical contamination to impact the water table.

5. Transportation Features Bordering Property Limit Potential Exposure Scenario - The property is bordered to the north by a railroad corridor, to the west by Northside Drive, to the south by Sixteenth Street and to the east by the I-75/I-85 highway corridor which is approximately 400 feet in width. Each of these permanent features has acted as a soil exposure buffer between the property and adjoining properties. These engineered features coupled with the natural valley configuration of the property further appear to obviate the need for off-property soil sampling.

6. Combined Sewers Intercept Area Drainage - A six-foot diameter combined sewer main follows along the original valley occupied by the Atlantic Steel facility. This sewer joins with the larger north flowing (Orme Street) sewer located along the eastern property boundary and leading to Atlanta's R.M. Clayton wastewater treatment plant. These combined sewers intercept surface drainage in the area and likely also intercepts groundwater in deeper segments.

7. Future Use Established - Plans have been prepared indicating the specific use for each area of the property. Based upon this knowledge the characterization and delineation activities can be tailored consistent with these uses and associated exposure scenarios. A large portion of the property will be covered with buildings, streets and parking facilities. These engineered features will be designed to also serve as barriers to eliminate the potential for direct exposure to any contamination. In areas that will not be covered, the known future use will be used to develop exposure scenarios and to select appropriate depths of sampling in each area. For example, an area that will require construction excavation or "cut" will be sampled to at least the estimated depth of the cut. Conversely, an area that will require several feet of construction "fill" will generally limit the depth of soil sampling to surficial materials.

**Key Features of AD Approach**

The AD approach has been crafted to rapidly provide a reliable property-wide data set to support a rehabilitation and redevelopment program that can be accepted with confidence for the anticipated future use of the property. Details of the sampling program are provided in the Phase II Workplan document.

Key features of the groundwater AD and management strategy are as follows:

1. Anticipated future use of the property includes a prohibition on use of groundwater and a commitment to intercept groundwater discharge before exiting the property. The intercepted groundwater will be treated as necessary to allow discharge to the City of Atlanta sewer system. This commitment to groundwater use prohibition and interception and the fact that groundwater is not a potential source of drinking water in the area, effectively eliminates the potential for a future groundwater exposure pathway.

2. Groundwater is expected to flow into the property from the south, west and north perimeter with a discharge zone to the east where the property is bordered by I-75/85 and the combined sewer interceptor. This favorable groundwater configuration facilitates control and interception of groundwater. A series of at least 16 piezometers will initially be installed to map groundwater levels and flow directions across the entire property. This will be followed by installation of at least eight additional water quality monitoring wells installed in areas which have the highest potential to be impacted by specific PIAs. This PIA sampling is designed to identify high-end ("worst case") contaminant concentrations in groundwater underlying the property. Three of these well samples will also be analyzed for RCRA Appendix IX constituents to broadly look for otherwise unanticipated constituents that might be present in groundwater.

3. At least one additional monitoring well will be installed into bedrock at a strategically selected location to evaluate vertical flow potential and associated bedrock water quality.

4. Additional monitoring wells will subsequently be installed in the property groundwater discharge zone to characterize groundwater flow and quality for design of groundwater boundary interception and any necessary treatment.

The key features of the proposed AD Soil approach are as follows:

1. The final rehabilitation of the site includes the use of engineering and/or institutional controls for soil. This institutional control will require that any future modification of the final engineering

controls must be supervised by a professional engineer. Upon completion of the modification, the professional engineer must certify to the owner (or future owner(s)) and the Georgia Environmental Protection Division that the modification is consistent with the originally approved engineering controls for soils.

2. The entire property will be subject to a baseline soil sampling grid program on a 200 foot grid spacing in the future residential area and a 300 foot spacing on the remainder of the property. Additionally, the sampling grid may be extended across Sixteenth Street in the southeast (downslope) corner of the property onto lots (outparcels) owned by Atlantic Steel if grid sample data obtained along the north side of Sixteenth Street appear to indicate the potential for offsite contamination in this downgradient corner of the Atlantic Steel property. This site-wide baseline grid will provide both grid-specific data points and probability distribution plots for the entire property from which appropriate estimates of potential soil exposure concentrations can be selected for all areas of the property. Grid sampling depths are selected on the basis of the potential for future exposure to soil at each location considering both the site development plan and future construction grade.

3. At least ten (10) randomly chosen soil grid locations will initially be sampled and analyzed for RCRA Appendix IX constituents to confirm the appropriate analyte list for the property-wide sampling.

4. In addition to the property-wide soil baseline grid, specific "worst-case" samples will also be analyzed from internal Potentially Impacted Areas (PIAs) where recent and historic activities have likely contributed to localized soil contamination. These PIA samples are expected to represent high-end ("worst case") concentrations on the property over and above the baseline distribution of contaminants.

5. In combination, the property-wide soil baseline grid distribution and the PIA concentrations will provide a sufficient data base for evaluation of various soil exposure scenarios anywhere across the property.