SURCHARGE AND SETTLEMENT MONITORING PLAN AMERICAN STEEL FOUNDRIES SEBRING LANDFILL FACILITY ALLIANCE, OHIO

Prepared for

AMERICAN STEEL FOUNDRIES, INC.
Alliance, Ohio

Prepared by

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Three Hawthorn Parkway
Vernon Hills, Illinois 60061

December 1994
(Revised February 1995)

Work Order No. 10752-001-001

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SECTION 1
INTRODUCTION

1.1 OVERVIEW OF PLANNED WORK

The scope of work proposed to be implemented by ASF under this Surcharge and Settlement Monitoring Plan includes placing a completed surcharge soil (foundry sand) load on a center area of the landfill to pre-stress and consolidate the landfilled materials. Large, traditional earthmoving equipment will be utilized to place the surcharge materials. The center area of the landfill will be surcharge loaded due to the presence of soft, high moisture content and unconsolidated landfill material in this area. Higher moisture content soils and waste resulted from a depression in the central area of the landfill that typically retained and ponded precipitation. The central area of the landfill is also being surcharge-loaded to minimize the potential of slope reversals in the center of the landfill after placement of the cover system.

The material (foundry sand) is an appropriate surcharge material and will serve to pre-contour the landfill to achieve planned final grades. As a result, the surcharge material will be left in place with limited regrading prior to cap construction. All surcharge material will be left within the limits of the final landfill cover system.

A number of settlement plates will be constructed beneath the surcharge load and atop the currently existing landfill grade. Settlement monitoring will be conducted by surveying settlement plate risers on a monthly basis for up to 18 months after the load is placed. Survey data will be analyzed to determine the degree of expected settlement and transmitted to Ohio Environmental Protection Agency (OEPA) on a monthly basis. Various drawings generated during the work will also be transmitted to Ohio EPA.

This activity of surcharge placement and monitoring will prepare the landfill mass for final closure and cover system construction.

~~1.1~~ 1.2 BACKGROUND

The American Steel Foundries (ASF) Sebring landfill facility is located on the east side of the City of Alliance, Ohio. The site is comprised of 14.7 acres of which approximately 8 acres has been used as a spent and nontoxic foundry industrial sand disposal area and 6 acres remains undeveloped. Materials disposed of at the landfill included open hearth slag, sand, dirt, silica sand, various types of brick, and sand washer sludge. Prior to its purchase by ASF, the property was used for strip mining. Current foundry sand thicknesses range from 8 to approximately 45 feet in the south-central portion of the landfill.

ASF has prepared a closure plan for submittal to the Ohio EPA which describes the methodology and design for closure of the landfill. In order to meet the minimum grades required to provide positive drainage of the landfill cover system, the central portion of the site will require 10 to 20 feet of general fill material in order to meet the design grades shown in the closure plan. ASF intends to construct the surcharge load, allow potential consolidation to occur in the Former Pond Area in advance of the cover construction, and then use the surcharge material previously placed as a portion of the general fill material needed to construct the subgrade for the final landfill cover. Based on past site operating information, disposal of sand washer sludges and high moisture content and unconsolidated foundry sands had generally occurred in the central portion of the landfill site. This ~~area~~ Former Pond Area of the site may experience potentially excessive settlement during and after construction of the final landfill cover. Because of this possibility and the potential detrimental effects settlement could have on the performance of the landfill cover system, ASF has prepared this plan to provide surcharge loading and waste consolidation at the site, in advance of landfill closure construction activities. This activity will serve to minimize post-closure impacts of landfill settlement.

~~1.2~~ 1.3 OBJECTIVE

The objective of this plan is to define the scope of work and outline the monitoring requirements for conducting pre-closure surcharge loading on the landfill. The surcharge will consist of relocating approximately 55,000 cubic yards (c.y.) of existing, on-site stockpiled sands onto the landfill area containing high moisture content and unconsolidated sands. By constructing this engineered surcharge load, differential and total settlement, which potentially could occur following closure of the landfill, would be forced to occur prior to construction of the final cover. This plan includes a general description of the site, a technical approach which describes the site preparation activities (i.e., baseline surveys, tree clearing, etc.), surcharge placement methods and grading plans, and monitoring and documentation requirements. A proposed schedule for completing the work is also presented in Section 3.

SECTION 2
TECHNICAL APPROACH

2.1 OVERVIEW

The surcharge and settlement monitoring plan is a work plan for implementing the construction of a surcharge load and for subsequently monitoring and reporting settlement prior to final closure of the landfill. The scope of work includes the following principal work elements:

- Baseline survey and site preparation.
- Surcharge material placement, compaction, and grading.
- Settlement monitoring surveys.
- Documentation and reporting.

It is anticipated that this work will be implemented by two parties under contract to ASF (Owner), an earthwork/grading contractor (Contractor), and a local civil Engineering/ surveying firm (Engineer). All work to be performed on site will be conducted in accordance with an approved Health and Safety Plan prepared in accordance with applicable portions of 29 CFR 1910 and 29 CFR 1926, and U.S. EPA/Ohio EPA guidance documents that address site health and safety.

2.2 SCOPE OF WORK

The scope of work presented below outlines the requirements for implementation of the surcharge and settlement monitoring plan. Activities described herein are to be completed in accordance with generally accepted professional engineering and surveying methods.

2.2.1 Baseline Survey and Site Preparation

Baseline Survey (By Engineer)

Drawing 1 shows the existing site topographic information based on an areal survey of the landfill site conducted in November 1991. Surcharge fill material has been delivered to the site after this survey was performed and is generally located in stockpile areas shown on the drawing. The estimated volumes for each area are also shown on the drawings. Thus, this site topographic map may not depict current site topography.

Prior to relocating any surcharge material, the Engineer will complete a baseline horizontal and vertical control survey of the area to receive surcharging. The limits of the survey and minimum survey grid intervals will be as shown on Drawing 1.

In general, the baseline survey shall extend 50 feet beyond the top of slope as it exists at the time of construction and to the top of the existing high ground on the east edge of the surcharge area. Revised Drawings 1 and 2 show the limits of the area to be surveyed and graded with surcharge fill. The limits of the survey extend slightly beyond the surcharge area to establish additional vertical survey control on the landfill prior to closure. The Engineer shall prepare a contour base map of the surcharge area for use in monitoring and controlling surcharge placement and grading. The baseline survey shall be prepared as an Engineering drawing and submitted to the Owner (or its representative) as a full-size paper copy and AutoCADD file. A copy of this survey will also be forwarded to the Ohio Environmental Protection Agency (OEPA).

Site Preparations (By Contractor)

Site preparation tasks include mobilization of personnel and equipment to the site, set up of temporary facilities, equipment staging/maintenance areas (if necessary), and removal of a limited number of trees within the surcharge area. The contractor shall provide all

temporary facilities necessary to complete the work. The contractor will coordinate and obtain approval from the Owner for location of any temporary facilities.

Site preparation activities also will include placement of erosion and sediment control structures to include silt fences. The location of silt fence erosion control structures are shown on Drawing 1. Additional measures may be required during construction based on the contractor's sequence of construction.

Trees within the limits of surcharge placement shall be removed prior to placement of surcharge material. ~~Trees larger than 4 inches in diameter will be cut to~~ All trees and woody vegetation shall be cut off or bulldozed to within 12 inches of the base of the trunk. ~~All trees and woody vegetation shall be cut off within 12 inches of the base of the trunk.~~ Trees and vegetation shall be cut into manageable sizes and staged along the north end of the site, outside the limits of the surcharge fill area for subsequent ~~disposal~~ management during final closure of the landfill. ~~Trees less than 4 inches in diameter shall be cleared by saw cutting or bulldozing and shall be evenly incorporated into the surcharge fill.~~ Grasses present within the limits of surcharging or present on the foundry sand stockpiles will not be removed, but will be incorporated evenly into the fill during material placement. No chipping or further reduction in size is required for clearing debris under the scope of this contract. All tree and vegetation management and/or off-site disposal will be the responsibility of the Contractor conducting the implementation of the overall closure plan. Vegetation will not be placed or buried within the surcharge fill area.

2.2.2 Surcharge Material Placement and Grading (By Contractor)

Surcharge material is currently stockpiled on site as shown in Drawing 1. The surcharge material has been processed through a screening process to separate the finer sands from the coarser fraction. Area ~~1~~ 4 includes unprocessed sands and the coarse fraction generated from the screening process. Areas ~~2~~ 1 and ~~3~~ 2 consist of the finer materials. Area ~~4~~ 3 is a stockpile of fine materials generated from sand washing process. This material will be

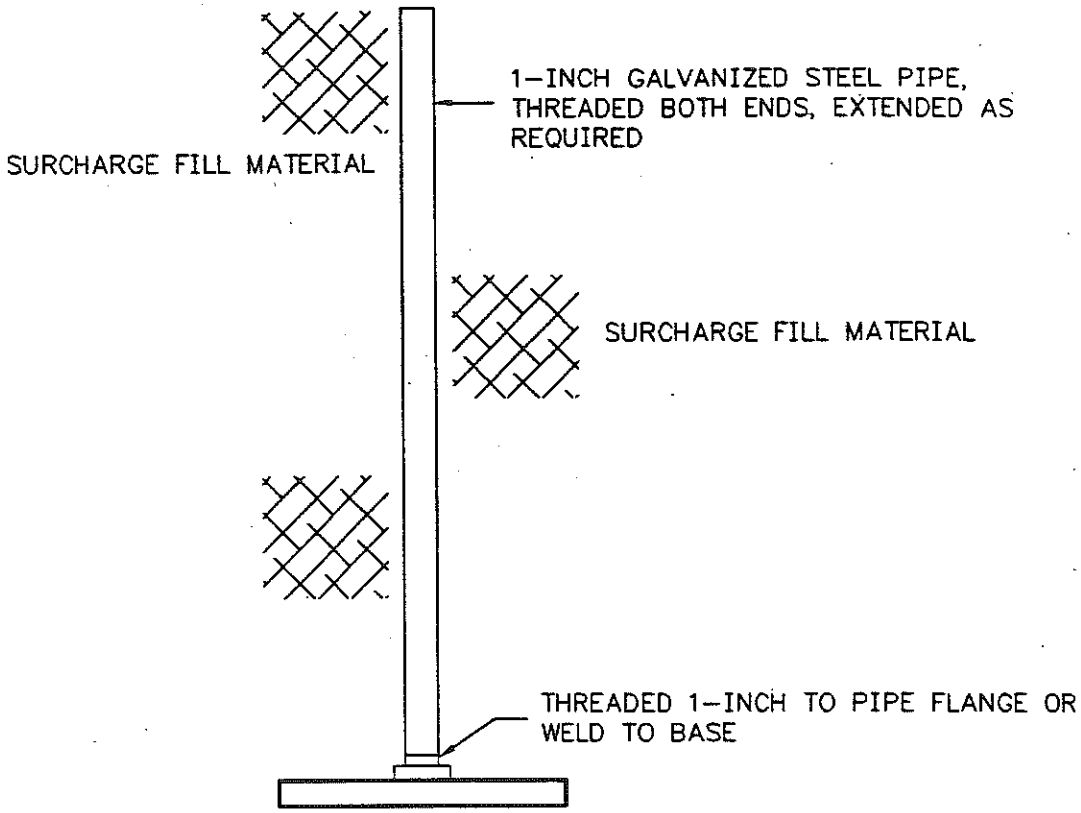
considered a high moisture content sand and will require special handling as described below.

Surcharge fill material may be transported from the stockpile locations to the surcharge area by using standard earthwork machinery available to the contractor. The intent is to allow contractor to use the most cost-effective and efficient approach to handling the fill material. During mobilization, the contractor shall present his material management approach to the Owner to include type and quantity of equipment used, daily schedule, and staffing plans. Material may be pushed directly into the surcharge area by bulldozer, scraper, etc., if stockpile location warrants this approach.

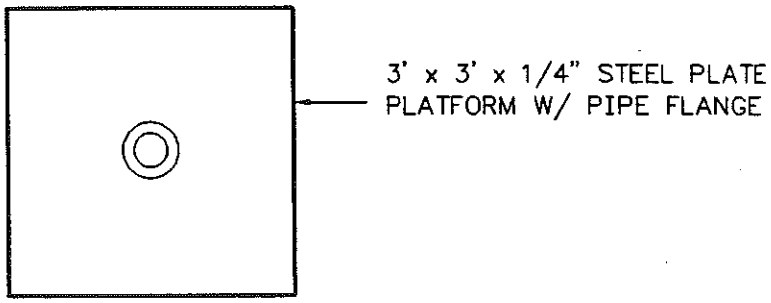
An initial surcharge material lift thickness of 2 to 4 feet shall be placed in each section of the designated fill area (see Drawing 1). The purpose of the 2- to 4-foot thickness is to provide a suitable compacted working surface above the existing soft, wet soils in the former pond area of the landfill. A lesser thickness may be utilized if subgrade conditions allow for continued stability at thinner lifts. This initial lift thickness will also provide for drainage of excess pore waters from the fill. The material shall be compacted by tracking in with a bulldozer (Cat D7 or equivalent). ~~No additional compactive effort or compaction testing will be required~~. Following placement of the initial ~~4-foot~~ lift of surcharge material, the contractor will construct settlement plates with riser pipes to monitor settlement of the fill material.

The settlement plates will consist of a 3' x 3' x 3/4" steel plate with a 1-inch diameter cast iron pipe connected by a threaded flange welded to the plate. Figure 2-1 shows a detail of the settlement plate and riser pipe. Riser pipes will be threaded on both ends and will be extended by the Contractor, as necessary, to accommodate the height of the surcharge fill. The location of settlement plate risers are shown on Drawing 2. Prior to placement of the plate, the elevation of the surcharge grade under the plate will be recorded by the Engineer and used as a base grade on which to calculate and compare future settlement. The top

ELEVATION



PLAN



NOTE:

1. GALVANIZED STEEL PIPE SHALL EXTEND A MINIMUM OF 1-FOOT ABOVE THE TOP OF THE SURCHARGE FINAL GRADE.
2. DRAWING NOT TO SCALE

FIGURE 2-1

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Vernon Hills, Illinois
60061

SETTLEMENT PLATE DETAIL

AMERICAN STEEL FOUNDRIES
Alliance, Ohio

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elevation of each riser pipe will be recorded as well as each pipe extension in order to accurately record settlement occurring at the base of the surcharge fill.

Surcharge fill will then be placed by the Contractor around each plate and riser pipe. A plate compactor may be required around riser pipes if earthmoving equipment cannot get sufficiently close to compact material around the pipe. ~~by tracking~~. The settlement riser pipes will be marked with fluorescent paint or flagging to make them visible to construction equipment operators. Equipment operators will be instructed to not disturb the integrity of the settlement plate/riser pipes. Once initial stabilized fill lifts are placed around riser pipes, surcharge fill placement will continue. The Engineer will be present during contractor installation of settlement plates and initial riser pipe lengths.

Following placement of the initial 2- to 4-foot surcharge lift, all additional surcharge material will be placed by the contractor in 2-foot lifts and compacted by tracking in with bulldozer equipment (Cat D7 or equivalent). Material will be placed in sequential lifts in accordance with the surcharge grading plan shown in Drawing 2. The final elevation grades shown on the plan are meant to provide general direction to surcharge fill placement. Imported general fill will not be required to meet the design grades as shown on Drawing 2. Conversely, if additional surcharge material is still available after reaching the design elevations, the additional surcharge will be placed in the central portion of the surcharge area. The grading plan for additional fill material, if required, will be pre-approved by the Owner's representative.

High moisture content (wet) sand stockpiled on site will be incorporated into the surcharge fill during construction. These sands may require special handling. The wet material will be spread in 8- to 12-inch lifts across the surcharge fill area and covered with other surcharge fill materials of lower moisture content. Wet sands will not be placed in any one location, but will be spread evenly over the surcharge area and incorporated and compacted with other drier materials. Following completion of surcharge fill construction, the Engineer

will conduct a grid survey of the surcharge area. This survey will also provide horizontal and vertical control on settlement plate/riser pipe monitoring locations.

During surcharge excavation, transport, and grading, the Contractor shall maintain sufficient dust control measures to ensure dust emissions do not become a hazard for site workers or a nuisance to surrounding landowners. Erosion and runoff control structures (silt fence) must also be maintained during construction.

2.2.3 Settlement Monitoring Surveys (By Engineer)

Following completion of surcharge fill construction, the Engineer will conduct periodic monitoring of settlement plate risers to document any change in elevation due to settlement for a period of 18 months. Monitoring will consist of taking elevations of each riser pipe with respect to a benchmark previously established on site or one constructed by the Engineer. Elevation surveys will be conducted once a month by a qualified land surveyor. Surveys will be conducted using generally accepted survey methods, to reasonable professional survey accuracies. All riser pipes will be surveyed during each interval and information presented as described in Subsection 2.2.4. During each periodic survey, the Engineer will document any damage to riser pipes or any evidence of visual differential settlement in the fill. Following completion of surcharge monitoring, the riser pipes will be cut off below grade and abandoned in place prior to construction of the final cover. Riser pipes will not penetrate the final cover system.

The determination of adequate settlement and consolidation of the landfill surcharge area will consider the following engineering criteria:

- The degree of actual settlement measured against theoretical calculations and geotechnical parameters.
- The potential for differential settlement resulting in landfill cover system depressions or slope reversals.

- The potential that additional post-closure settlement would result in excessive maintenance during post-closure.

This evaluation will be presented in the final monitoring data transmittal to OEPA.

2.2.4 Documentation and Reporting

The Engineer will provide the Owner with the survey data, summary of site activities including estimated volume of surcharge material placed, and results of the initial and post-construction riser pipe surveys within 15 days of completion of surcharge fill construction. Monthly thereafter, the Engineer will present a monthly status report to the Owner describing current conditions on site (i.e., damage to riser pipes, excessive settlement, etc.) and presenting the subsequent riser pipe survey data. The survey data should be presented in a table format showing riser number, location, date, and elevation for each monitoring interval conducted to date. The final column should reflect the total settlement which has occurred to date. Table 2-1 presents an example settlement data reporting format. As an appendix to the monthly status report, the Engineer will provide photocopies of survey field notes showing benchmark locations, survey calculations, and other relevant data.

The monthly report shall be transmitted by the Engineer on or before the 10th day of each month to:

American Steel Foundries
10 South Riverside Plaza
10th Floor
Chicago, IL 60606
Attn: Ms. Bernadette Wellman
FAX No.: (312) 258-5466

AND

Roy F. Weston, Inc.
Three Hawthorn Parkway
Suite 400
Vernon Hills, IL 60061
Attn: Mr. Gary Deigan
FAX No.: (708) 918-4055

Engineering drawings and records of monthly monitoring reports shall be forwarded by ASF to the OEPA upon completion of settlement monitoring activities. The report will include documentation of material handling and placement techniques. The OEPA will be consulted following completion of surcharge monitoring to determine if any additional measures are required with respect to surcharging of the existing fill material prior to construction of the final cover system. The need for additional measurement, testing, or compaction can be determined at that time and, if necessary, this work can be incorporated into the subsequent closure construction activities.

Table 2-1

Sample Report
Riser Pipe Survey Data
American Steel Foundries, Inc.
Sebring Landfill
Report for Month of _____, 1995
Date of Field Survey: _____

Riser Station/Grid Location	Initial Survey Elev.	This Survey Elev.	Settlement This Period	Total Settlement to Date

Notes/Observations/Comments:

_____

_____

_____

_____

SECTION 3
SCHEDULE

3.1 SURCHARGE PLACEMENT (BY CONTRACTOR)

Surcharge construction is expected to be completed in one phase. Construction is anticipated to span a maximum 4-week timeframe following ASF's Notice to Proceed. The Contractor will provide the Engineer with an estimated construction schedule to include type and quantity of equipment to be utilized. No work will be conducted on weekends, before 7 a.m. or after 6 p.m. daily. Surcharge placement will not take place during major storm events when the increase in precipitation will result in loss of strength or density of placed fill.

3.2 SURCHARGE MONITORING/SURVEY (BY ENGINEER)

The Engineer will conduct surcharge monitoring monthly until survey results indicate that adequate settlement and consolidation has occurred. The Owner will make the determination to cease surcharge monitoring based on survey results. At this time, monitoring is expected to continue for a period of 12 months following completion of surcharge construction. The Owner may choose to discontinue surcharge monitoring at any time during this period.

GROUNDWATER MONITORING PROGRAM
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
ALLIANCE, OHIO

Prepared for

AMERICAN STEEL FOUNDRIES
Chicago, Illinois

Prepared by

ROY F. WESTON, INC.
Three Hawthorn Parkway
Vernon Hills, Illinois 60061

September 1995

Work Order No. 10752-005-001

GROUNDWATER MONITORING PROGRAM
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES

Prepared for

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Chicago, Illinois 60606

September 1995

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C	Outline for the Assessment Monitoring Program
D	Statistical Procedures
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SECTION 1
INTRODUCTION

The Groundwater Monitoring Plan for the American Steel Foundries (ASF) Sebring, Ohio Landfill (facility) has been prepared in response to an Administrative Order on Consent (AOC) issued by the United States Environmental Protection Agency (U.S. EPA) to American Steel Foundries (ASF), Alliance, Ohio (U.S. EPA I.D. No. OHD 017497587) for the Sebring Landfill.

In March 1992, Residuals Management Technology, Inc. (RMT) prepared a Groundwater Sampling and Analysis Plan and a Groundwater Quality Assessment Plan in advance of the requirements of the AOC. Results of the Groundwater Quality Assessment Plan and a proposed Groundwater Monitoring Plan were submitted to the Ohio EPA (OEPA) on 16 February 1993. The groundwater monitoring program was initiated in December 1993, with the beginning of quarterly background groundwater monitoring. Quarterly background monitoring was completed in September 1994. OEPA has reviewed and provided technical comments on various aspects of the February 1993 plan.

ASF contracted Roy F. Weston, Inc. (WESTON®) to amend the plan in response to OEPA review comments. As part of this task, WESTON installed additional groundwater monitoring wells at the facility and completed the first of what is to be semi-annual groundwater sampling of the monitoring network. This revised Groundwater Monitoring Plan has been developed to meet the requirements of 40 CFR 265.93 and the Ohio Administrative Code (OAC) 3745-65-90 through -94.

Pursuant to OAC 3745-65-90, the groundwater monitoring program should be capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility. The overall objectives of the groundwater monitoring program will be to routinely monitor whether hazardous waste or hazardous waste constituents have entered the groundwater, and if so, to determine the concentration, rate, and extent of migration within the uppermost groundwater-producing zone. This monitoring program will

consist of a groundwater monitoring system, which will meet the requirements of OAC 3745-65-91 and comply with rules OAC 3745-65-92 through OAC 3745-65-94.

Section 2 of this plan provides a summary of the facility background and environmental setting. Information outlined in Section 2 also provides the basis for the groundwater monitoring program. Section 3 provides details concerning the implementation of the groundwater monitoring program. Section 4 provides a detailed Sampling and Analysis Plan (SAP), which outlines the procedures that will be followed during the implementation of the groundwater monitoring program or during any additional work that may be required in the future.

SECTION 2

SITE BACKGROUND AND ENVIRONMENTAL SETTING

2.1 FACILITY BACKGROUND

2.1.1 Facility Description

The Sebring facility is located at the intersection of Lake Park Boulevard and Heacock Road in Smith Township near the Village of Sebring, Mahoning County, Ohio. The facility is located in the northeast quarter of Section 33, Township 18 North, and Range 5 West (Figure 2-1). The entire facility covers an area measuring approximately 14.7 acres. The landfill (limit of waste placement) covers an area measuring approximately 8 acres.

2.1.2 Facility History

Prior to ASF's purchasing the property, the facility was used for the surface (strip) mining of soft shale coal and clay. The mining operations produced a large dog-leg shaped strip pit, which subsequently filled with water. In 1966, ASF purchased the property, which included a portion of the water-filled strip pit. The southeast portion of the dog-leg shaped pit was not purchased; it is known as the Tecumseh Pond and belongs to the Tecumseh Village Mobile Home Park, Inc.

On 25 July 1967, the Ohio Department of Health (ODH) received a request from ASF for a refuse dumping permit. The permit was granted on 7 August 1967.

Wastes approved for disposal in 1967 included open hearth slag, sand, dirt, silica sand, and various types of brick and sand washer sludge. In the 1970s, ASF began disposal of wastes generated during various production processes at the ASF Alliance Foundry. These wastes may have included electric arc furnace (EAF) dust, which may have been characteristically hazardous for cadmium (D006) and lead (D008). The majority of the material disposed of at the site is nonhazardous foundry sand. The thickness of the wastes range from a few feet near the limits of waste placement to approximately 45 feet near the central part of the

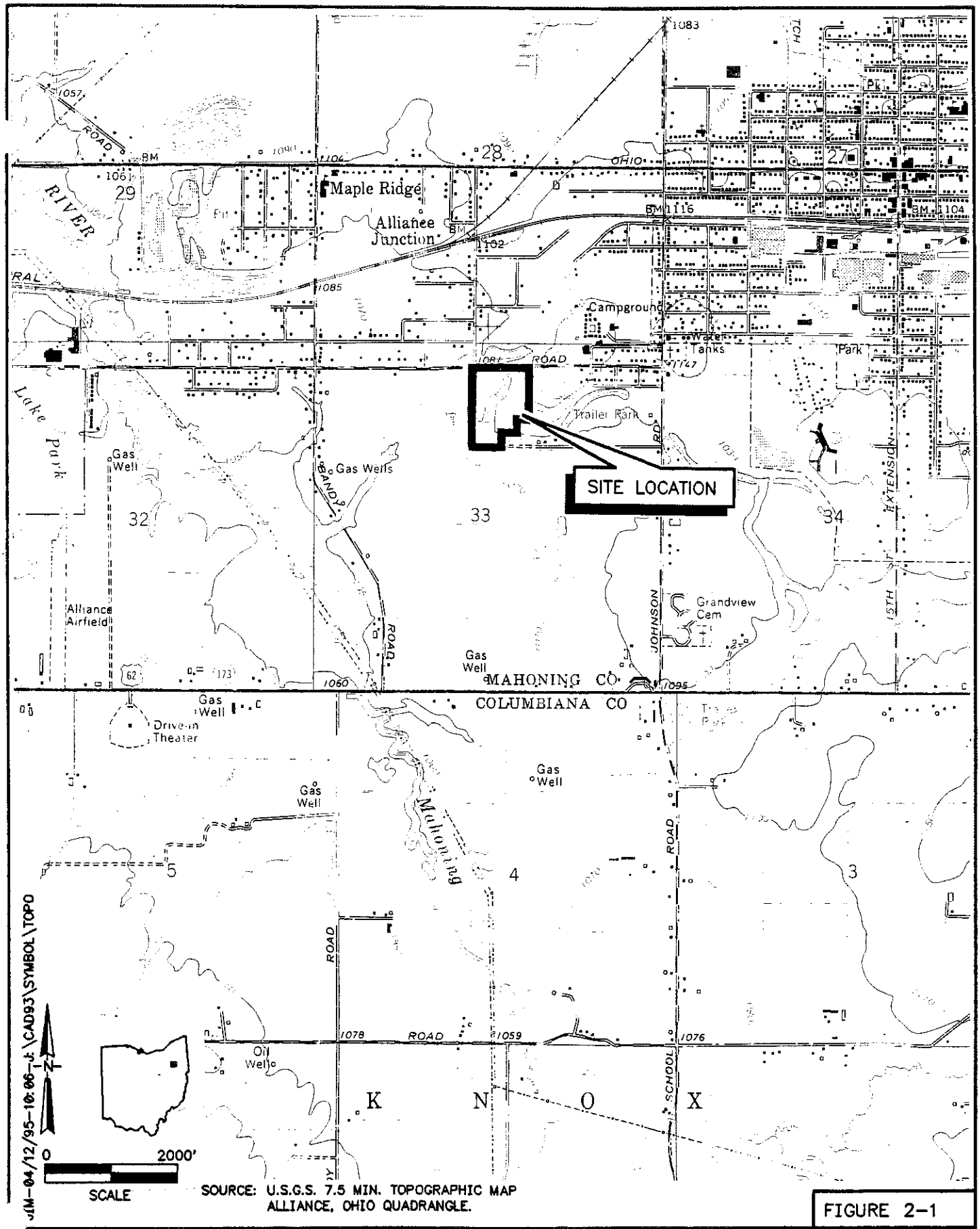


FIGURE 2-1

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

SEBRING FACILITY

AMERICAN STEEL FOUNDRY
Alliance, Ohio

landfill. Figure 2-2 presents a facility base map that shows the approximate boundary line of the limits of waste placement.

2.2 ENVIRONMENTAL SETTING

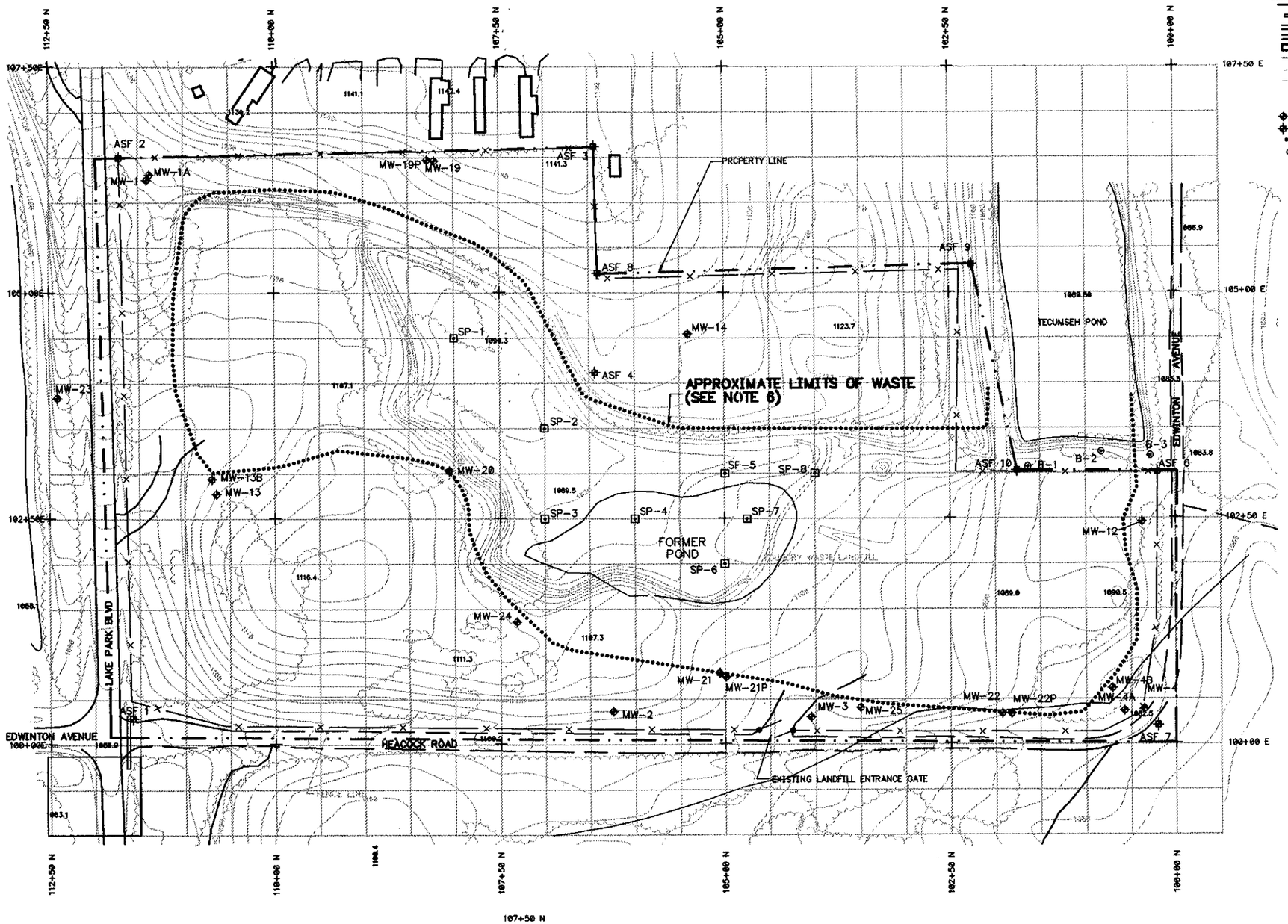
2.2.1 Demography and Land Use

The facility is located approximately 0.5 miles southwest of Sebring, Ohio. According to a 1990 census, Sebring has a population of 4,848. The facility is bordered to the north by Lake Park Boulevard, to the east by the Tecumseh Village Mobile Home Park, to the south by Edwinton Avenue, and to the west by Heacock Road. The area surrounding the facility consists primarily of forested land, agricultural properties, and sparsely populated residential properties.

2.2.2 Climate

The climate of Mahoning County is classified as continental, which is characterized by widely ranging summer and winter temperatures and by a moderate amount of precipitation that falls mainly during the warmer months of the year. The amount of precipitation increases with increases in elevation and roughness of terrain. Because of the effects of elevation and air drainage, temperatures tend to be lower in hilly areas than in more level areas.

Because Mahoning County is in the northeastern part of Ohio, its climate is somewhat colder and drier than the climate for the state as a whole. The mean annual temperature of Mahoning County is about 2.5 degrees lower than that for the rest of the State. This difference is especially noticeable in summer in that the county has an average of only 11 days per year in which the temperature reaches 90 degrees F or higher. Lake Erie has virtually no moderating effect on the temperature in the county.



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1069.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 15, 1965 WITH ADDITIONAL SURVEY CONDUCTED IN JUNE 1988.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM K&M INC. OF GRAND FORKS, ND DATE OF PHOTOGRAPHY NOV. 17, 1991.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF 100000N, 100000E.
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE

MONUMENT NO.	NORTHING	EASTING
ASF 1	11158.33	10027.57
ASF 2	11172.95	10048.95
ASF 3	10643.49	10058.61
ASF 4	10637.38	10400.07
ASF 6	10017.8	10301.5
ASF 7	10020.0	10020.0
ASF 8	10648.28	10520.52
ASF 9	10224.59	10531.12
ASF 10	10175.10	10302.84

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE W/CAP SET. ALL OTHER ASF POINTS ARE METAL BURNSTEIN MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISED PRIOR TO CONSTRUCTION.

SOURCE MAP:
RMT, INC.

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FIGURE 2-2

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

FACILITY BASE MAP
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

2.2.3 Geologic Setting

2.2.3.1 Regional Geology

The site is located in the portion of the Allegheny Plateau Physiographic Province deposited during the late Wisconsinan Glaciation. Most of Mahoning County is covered by rather thick deposits of glacial drift, consisting of glacial till deposited directly from the glaciers and outwash material deposited by meltwater from the glaciers. Only a few areas within the county are not covered by glacial drift. Soils in these areas have formed in material that has weathered from the underlying bedrock.

The uppermost bedrock underlying the facility is the Clarion Shale Member of the Pennsylvania Aged Allegheny Formation. In general, the Pennsylvanian System, consisting of the Allegheny and Pottsville Formations, can be as thick as 468 feet and can range in age between 286 and 320 million years before the present (mybp). The Pennsylvanian system is underlain by the following bedrock sequence: Mississippian age bedrock (320 to 360 mybp) that can be up to approximately 1,200 feet thick; Devonian age bedrock (360 to 408 mybp) that can be up to approximately 3,000 feet thick; Silurian age bedrock (408 to 438 mybp) that can be up to approximately 1,400 feet thick; Ordovician age bedrock (438 to 505 mybp) that can be up to approximately 2,500 feet thick; Cambrian age bedrock (505 to 570 mybp) that can be up to approximately 720 feet thick; and Pre-Cambrian age (>570 mybp) crystalline basement rock. In this portion of Ohio, the bedrock units dip slightly to the south and east.

2.2.3.2 Local Geology

The middle portion of the site consists of a former surface (strip) mine pit. Mining operations included excavation for coal (Middle Kittanning No. 6 and Lower Kittanning No. 5 coal beds) and clay (Lower Kittanning underclay). This strip mine pit was excavated to a depth of approximately 45 feet below ground surface (bgs). The subsurface soils surrounding most of the northwest, west, and southwest portions of the facility consist of spoil materials that were removed during the excavation of the strip mine pit. Based on the

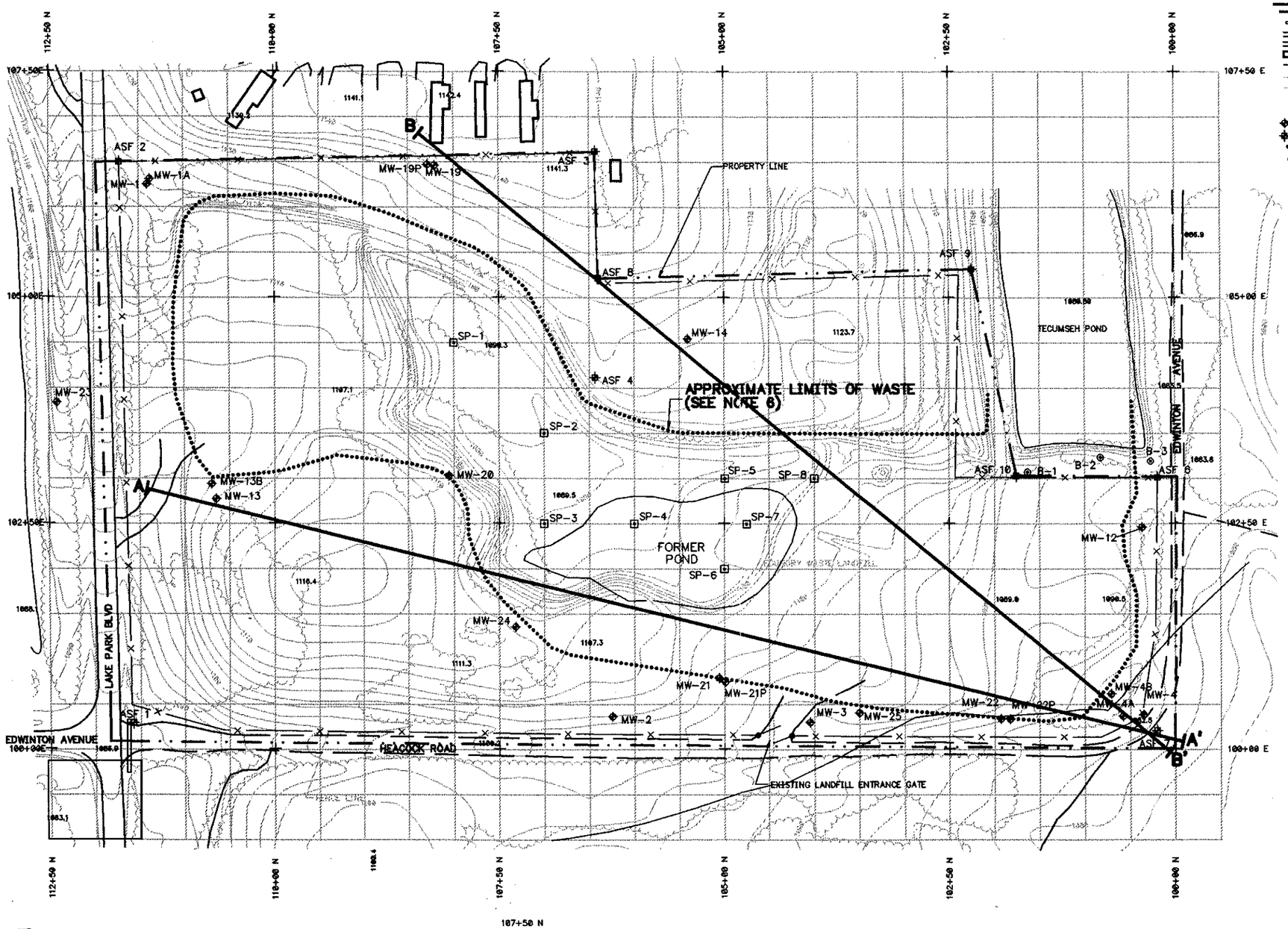
Soil Survey of Mahoning County, Ohio (U.S. Dept. of Agriculture, 1971), approximately 40 percent of the spoil material is excavated glacial till, and 60 percent is shale, siltstone, and sandstone. On the east side of the landfill, the bedrock surface is very near the surface and is only covered by a thin veneer of soil. The upper portion of the bedrock on this side of the landfill consists of sandstone and siltstone. The siltstone and sandstone units extend to a depth ranging from approximately 20 feet bgs to 45 feet bgs and overlie a competent shale unit. The bedrock units on the east side of the landfill form the highwall of the strip mine pit and are currently exposed within the open portions of the former strip mine pit. Throughout the remaining portions of the facility, the shale bedrock underlies mine spoils. Where the shale is the first bedrock encountered, the upper portions seem to be slightly weathered and fractured. The relatively thin weathered zone is underlain by competent shale.

It should be noted that WESTON has reviewed the drilling information provided from previous investigations and has attempted to delineate the interface between mine spoil material and shale bedrock. Since the lower portion of the mine spoils unit consists of layers of excavated bedrock, it is sometimes difficult to distinguish between the two units. WESTON has compiled the available drilling log information and has completed cross-sections to illustrate the relationship of the stratigraphic units underlying the facility. Figure 2-3 shows the location of the two cross sectional lines (A-A' and B-B'). Figure 2-4 presents cross-section A-A', which traverses from north to south across the facility. Figure 2-5 presents cross-section B-B', which traverses from northeast to southwest across the site.

2.2.4 Hydrogeologic Setting

2.2.4.1 Regional Hydrogeology

The major potable water aquifers in the area occur within bedrock of the Clarion Shale Member of the Allegheny Formation and the Homewood, Connoquenessing, and Sharyn Members of the Pottsville Formation, as well as the Mississippian Aged Berea Sandstone that underlies the Pennsylvanian aged bedrock. In Mahoning County, supplies of potable water are obtained from either reservoirs or wells screened within the above-mentioned



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1069.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 15, 1965 WITH ADDITIONAL SURVEY CONDUCTED IN JUNE 1968.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM KBM INC. OF GRAND FORKS, ND DATE OF PHOTOGRAPHY NOV. 17, 1991.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF 100000N, 100000E.
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE		
MONUMENT NO.	NORTHING	EASTING
ASF 1	11158.33	10027.57
ASF 2	11172.05	10048.05
ASF 3	10843.49	10668.61
ASF 4	10637.39	10488.67
ASF 6	10017.8	10301.5
ASF 7	10020.0	10020.0
ASF 8	10648.29	10520.52
ASF 9	10224.58	10531.12
ASF 10	10173.10	10302.84

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURNSTEIN MONUMENTS.
VERTICAL CONTROL WILL BE ESTABLISED PRIOR TO CONSTRUCTION.

SOURCE MAP:
RMT, INC.

N

0 125'
SCALE

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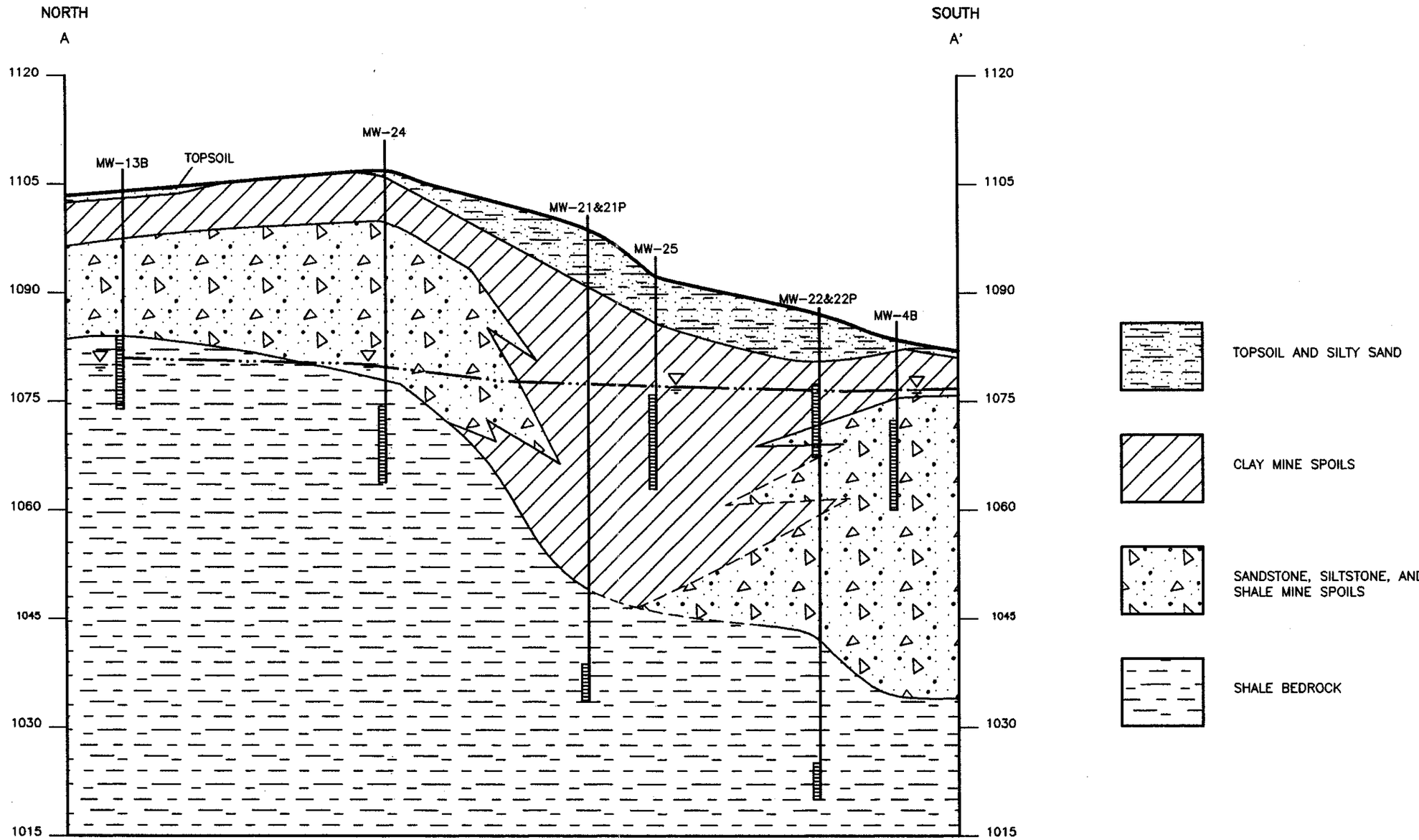
FIGURE 2-3

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

CROSS-SECTION LOCATION MAP
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio



LEGEND

WATER LEVEL

SCREENED INTERVAL

GROUNDWATER MEASUREMENTS COLLECTED ON MARCH 21, 1995

WATER TABLE SURFACE

* GEOLOGIC DRILL LOGS FROM WESTON, MARCH 1995.

VERTICAL 15' 0'

HORIZONTAL 150'

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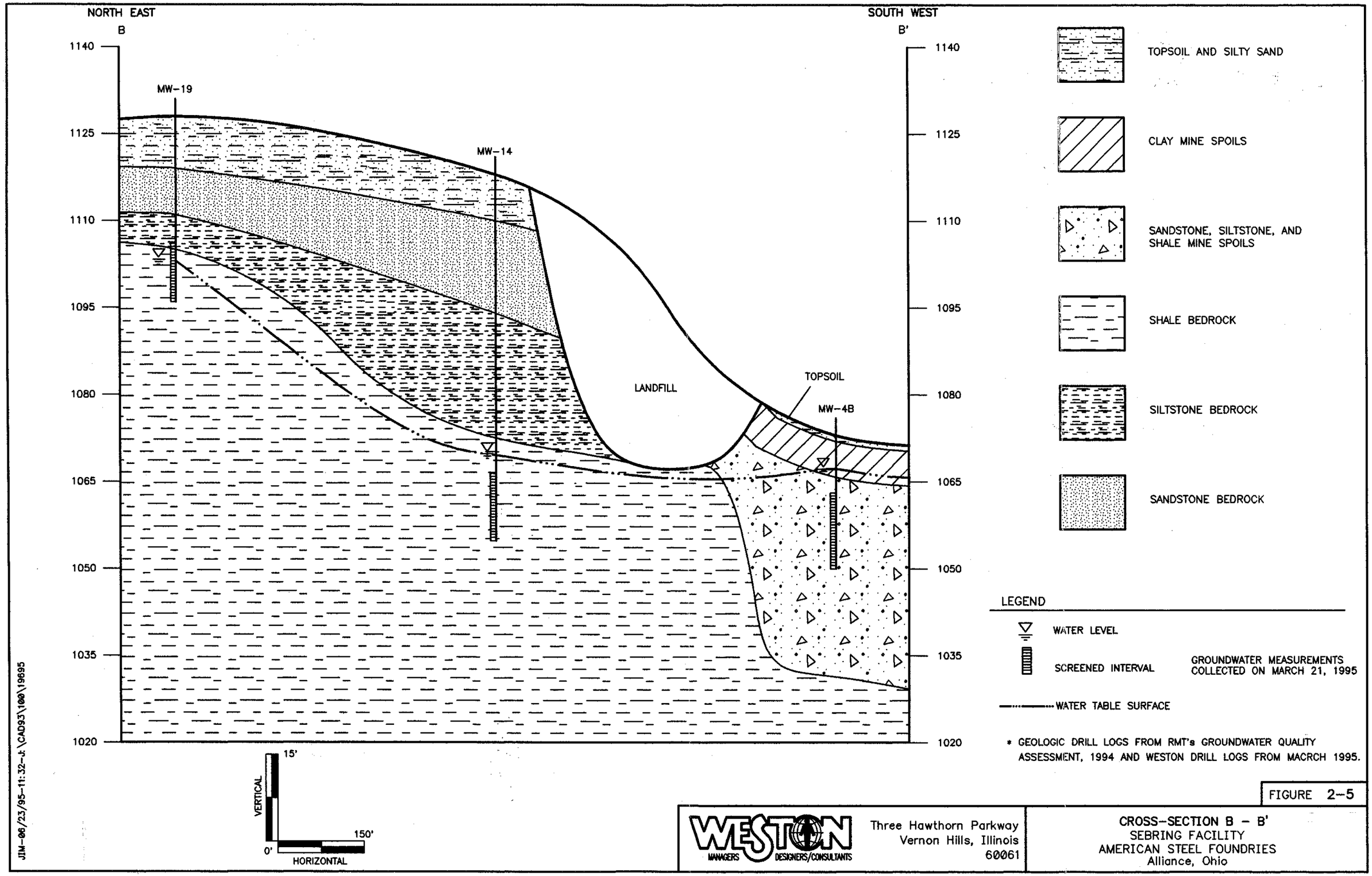
FIGURE 2-4

WESTON MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

CROSS-SECTION A – A'
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio


NORTH EAST
B
SOUTH WEST
B'
1140
1125
1110
1095
1080
1065
1050
1035
1020
MW-19
MW-14
MW-4B
LANDFILL
TOPSOIL
TOPSOIL AND SILTY SAND
CLAY MINE SPOILS
SANDSTONE, SILTSTONE, AND SHALE MINE SPOILS
SHALE BEDROCK
SILTSTONE BEDROCK
SANDSTONE BEDROCK
LEGEND
WATER LEVEL
SCREENED INTERVAL
GROUNDWATER MEASUREMENTS COLLECTED ON MARCH 21, 1995
WATER TABLE SURFACE
* GEOLOGIC DRILL LOGS FROM RMT's GROUNDWATER QUALITY ASSESSMENT, 1994 AND WESTON DRILL LOGS FROM MACRCH 1995.
15'
VERTICAL
0'
150'
HORIZONTAL
JIM-06/23/95-11:32-J:\CAD93\100\19695
WESTON
MANAGERS
DESIGNERS/CONSULTANTS
Three Hawthorn Parkway
Vernon Hills, Illinois
60061
FIGURE 2-5
CROSS-SECTION B - B'
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

bedrock units. The sandstone formations in Mahoning County generally yield adequate supplies of water for domestic use. The shale and limestone beds yield moderate amounts of water. The surficial glacial clays yield little water.

Groundwater flow throughout most of the county is toward the Mahoning River, which is located approximately one mile southwest of the facility.

2.2.4.2 Local Hydrogeology

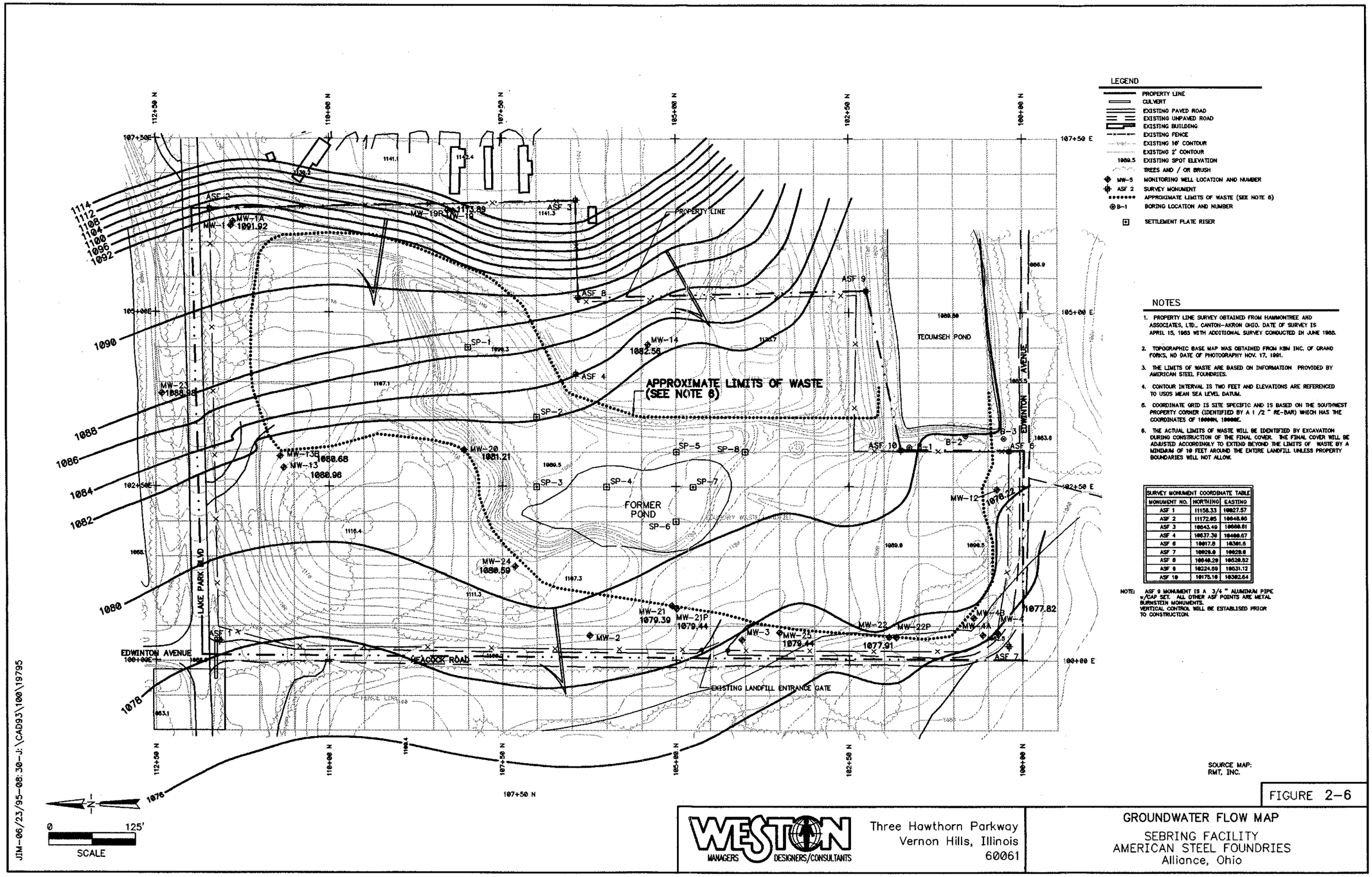
In the immediate vicinity of the facility, groundwater occurs under unconfined conditions within two hydraulically interconnected stratigraphic units (mine spoils and shale bedrock). Static water levels measured on 21 March 1995 are presented in Table 2-1. As this table shows, groundwater elevations range from 1,071.80 feet above mean sea level (MSL) to 1,113.89 feet above MSL. Since the elevation of the interface between the mine spoils and the shale bedrock varies throughout the site, the top of the water table can occur within either unit, depending upon the elevation of the groundwater surface versus the elevation of the stratigraphic interface. The relationship between groundwater and the stratigraphic interface elevations throughout the facility are depicted in the cross sections (Figures 2-4 and 2-5).

Figure 2-6 presents a contour map depicting the water table surface. As this figure shows, groundwater generally flows southwestward. The hydraulic gradient of the water table surface is quite steep (0.3 feet per foot [ft/ft]) east (upgradient) of the landfill boundary, where the bedrock surface is very near the ground surface. The hydraulic gradient begins to flatten out in the vicinity of the landfill and on the west side of the landfill, where the shallow subsurface soils consist of mine spoils and the bedrock occurs at a greater depth. There is less topographic relief on this portion of the site, and it appears that the hydraulic gradient of the water table surface conforms to the topography of the land surface. The hydraulic gradient throughout this area is moderately steep, averaging approximately 0.01 ft/ft (March 1995).

Table 2-1

Groundwater Elevation Data
March 1995
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Well I.D.	Top of Casing Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
MW-1A	1,126.09	34.17	1,091.92
MW-4B	1,085.76	7.94	1,077.82
MW-12	1,087.94	9.72	1,078.22
MW-13	1,107.70	26.74	1,080.96
MW-13P	1,106.80	26.12	1,080.68
MW-14	1,131.18	48.62	1,082.56
MW-19	1,141.16	27.27	1,113.89
MW-20	1,113.21	32.00	1,081.21
MW-21	1,101.12	21.73	1,079.39
MW-21P	1,101.12	21.68	1,079.44
MW-22	1,091.01	13.10	1,077.91
MW-22P	1,091.23	19.43	1,071.80
MW-23	1,107.81	18.83	1,088.98
MW-24	1,110.96	30.37	1,080.59
MW-25	1,095.39	18.00	1,077.31



NOTES

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SURVEY MONUMENT COORDINATE TABLE		
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ASF 3	10643.49	10660.61
ASF 4	10637.39	10400.67
ASF 6	10017.8	10301.6
ASF 7	10020.0	10020.0
ASF 8	10640.20	10520.82
ASF 9	10224.69	10531.12
ASF 10	10175.10	10302.64

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURNSTEIN MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISED PRIOR TO CONSTRUCTION.

SOURCE MAP: RMT, INC.

FIGURE 2-6

WESTON MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

GROUNDWATER FLOW MAP
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

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As shown in Figure 2-6, the presence of a surface water body (Tecumseh Pond) in the vicinity of the landfill seems to have little effect on the water table surface. In the immediate vicinity of the pond, the gradient of the water table is slightly flattened. Water level observations seem to indicate that the pond may serve as a minor groundwater recharge point.

Single well hydraulic conductivity tests (slug tests) were performed on four monitoring wells screened within the mine spoils (MW-4B, MW-21, MW-22, and MW-23) and on three wells screened within the shale bedrock (MW-1A, MW-21P, and MW-24). The test method used involved creating an instantaneous displacement of water within a well by inserting (positive displacement) and/or withdrawing (negative displacement) a solid PVC slug. Water level measurements were recorded at specific time intervals, while the positively displaced water (falling head test) or the negatively displaced water (rising head test) returned to equilibrium. An In-Situ Hermit SE1000B datalogger and a pressure transducer were used to record the water levels. Results of these tests were used to calculate hydraulic conductivity, using the computational methods described by Bouwer and Rice (1976). Results of these calculations are summarized in Table 2-2.

As these results indicate, hydraulic conductivity of wells screened within the mine spoils ranges from 1.0×10^{3} cm/sec (2.8 ft/day) to 8.5×10^{3} cm/sec (24.1 ft/day). The geometric mean of the hydraulic conductivity values for the mine spoils is 3.6×10^{3} cm/sec (10.1 ft/day). The hydraulic conductivity for wells screened within the shale bedrock ranges from 4.9×10^{5} cm/sec (0.14 ft/day) to 1.5×10^{3} cm/sec (4.2 ft/day). The geometric mean of the hydraulic conductivity values for the shale bedrock is 4.6×10^{4} cm/sec (1.3 ft/day). The graphs and equations used to calculate these results are provided in Appendix A.

The velocity of groundwater flow within each of the stratigraphic units underlying the facility was calculated using the average hydraulic conductivities presented above (10.1 ft/day for mine spoils and 1.3 ft/day for shale), the hydraulic gradient of the water table surface in the immediate vicinity of the landfill (0.01 ft/ft.), and assumed effective porosities of 30 percent for mine spoils and 10 percent for shale bedrock (assumes competent bedrock). Results of

Table 2-2

Hydraulic Conductivity Test Results
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Wells Screened in Shale			
Well	Test Type	Hydraulic Conductivity	
		Ft/Day	cm/sec
MW-1A	Falling Head	0.85	3.0×10^{-4}
MW-1A	Rising Head	1.2	4.2×10^{-4}
MW-20	Rising Head	10	3.6×10^{-3}
MS-21P	Rising Head	0.68	2.4×10^{-4}
MW-22P	Rising Head	1.5	5.3×10^{-4}
MW-24	Falling Head	0.14	4.9×10^{-5}
MW-24	Rising Head	4.2	1.5×10^{-3}
Geometric Mean		1.3	4.6×10^{-4}
Wells Screened in Mine Spoils			
Well	Test Type	Hydraulic Conductivity	
		Ft/Day	cm/sec
MW-4B	Falling Head	2.8	1.0×10^{-3}
MW-21	Falling Head	12.2	4.3×10^{-3}
MW-22	Falling Head	24.1	8.5×10^{-3}
MW-22	Rising Head	23.6	8.3×10^{-3}
MW-23	Falling Head	5.3	1.9×10^{-3}
Geometric Mean		10.1	3.6×10^{-3}

these equations indicate that the average linear velocity of groundwater flow is 0.34 ft/day (122 ft/yr) in the mine spoils and 0.13 ft/day (47 ft/yr) in the shale bedrock.

SECTION 3
PROPOSED GROUNDWATER MONITORING PROGRAM

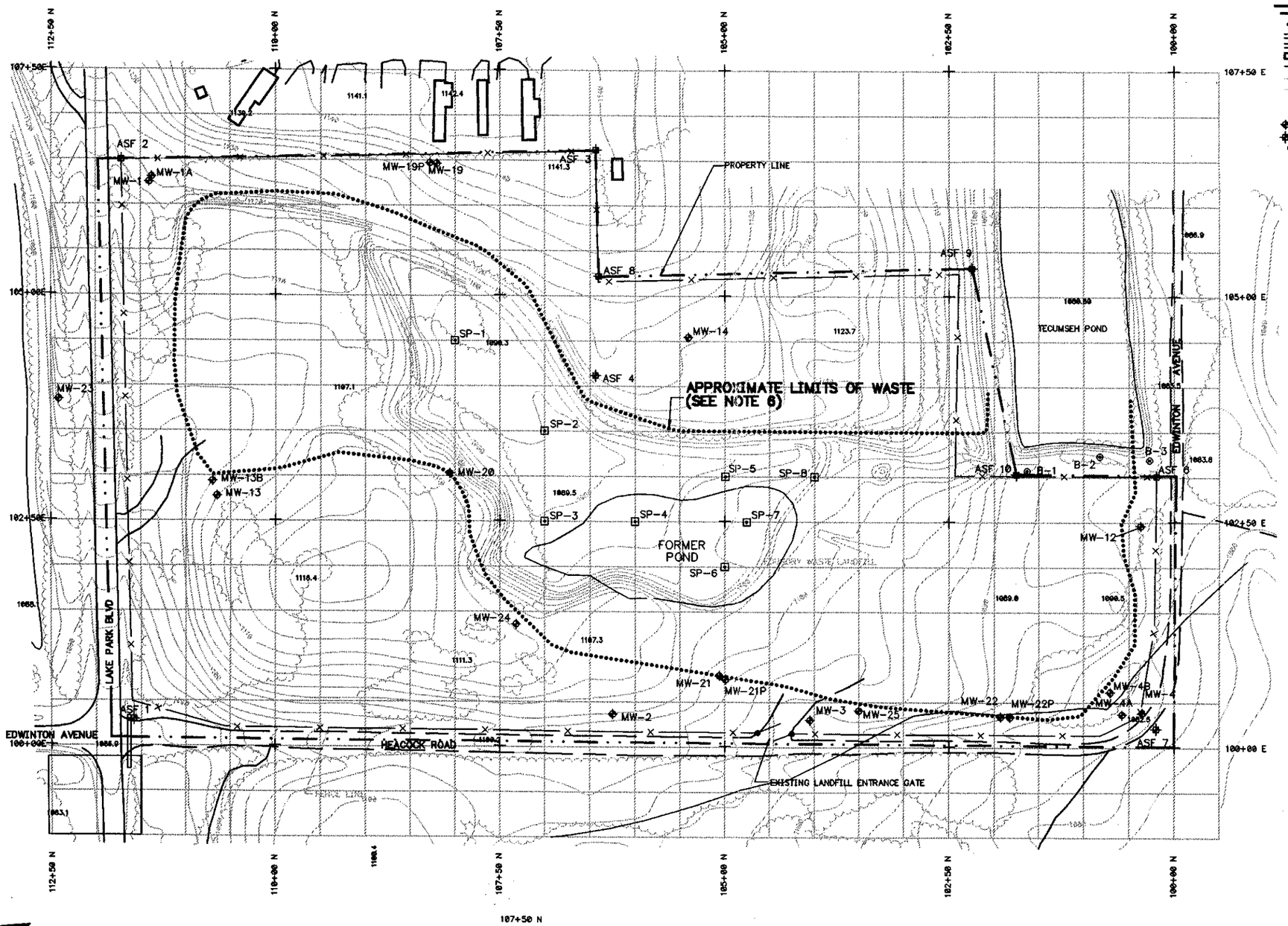
This section describes the proposed groundwater monitoring program that will be utilized to fulfill the requirements during the post-closure period at the ASF Sebring facility.

Pursuant to paragraph (D)(1) and (2) of OAC Rule 3745-65-90, ASF will implement a groundwater monitoring program capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility. This monitoring program will consist of a groundwater monitoring well network that meets the requirements of OAC 3745-65-91. The groundwater monitoring program shall comply with Rules OAC 3745-65-92 through OAC 3745-65-94.

3.1 PROPOSED MONITORING WELL NETWORK

The proposed groundwater monitoring network consists of 14 wells. Six wells (MW-4B, MW-12, MW-21, MW-22, MW-23, and MW-25) are screened within the mine spoils. Groundwater was first encountered within the mine spoils at these locations and is, therefore, considered to be the uppermost groundwater-producing zone. Eight wells (MW-1A, MW-14, MW-19, MW-13B, MW-20, MW-21P, MW-22P, and MW-24) are screened within shale bedrock. These are locations where the bedrock constitutes the uppermost groundwater-producing zone (upgradient side of the landfill), or locations where the waste within the landfill may be in direct contact with shale (downgradient side of the landfill). Figure 3-1 shows the location of each well within the proposed monitoring well network. The rationale for each location is as follows:

- Wells MW-1A, MW-14, and MW-19 are located along the eastern, upgradient side of the landfill boundary. These wells are screened within the upper portion of the shale bedrock and will be used as background measuring points for groundwater occurring in the bedrock.
- Well MW-23 is located on the north, upgradient side of the landfill boundary. This well is screened within mine spoils and will be used as the background measuring point for groundwater occurring in the mine spoils.



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1069.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

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4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF 10000N, 10000E.
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SURVEY MONUMENT COORDINATE TABLE		
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ASF 1	11158.33	10027.57
ASF 2	11172.95	10048.05
ASF 3	10643.40	10000.81
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ASF 5	10017.8	10301.5
ASF 7	10020.0	10020.0
ASF 8	10640.20	10520.52
ASF 9	10224.59	10531.12
ASF 10	10175.10	10302.04

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURKSTEIN MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISED PRIOR TO CONSTRUCTION.

SOURCE MAP: RMT, INC.

N

0 125'

SCALE

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FIGURE 3-1

WESTON MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

MONITORING NETWORK LAYOUT

SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

- Wells MW-4B, MW-21, MW-22, and MW-25 are located adjacent to the western, downgradient boundary of the landfill. These wells are screened within mine spoils and will be used as downgradient monitoring points for groundwater occurring within mine spoils.

- Well MW-12 is located adjacent to the southeast, downgradient side of the landfill boundary. This well is screened within the upper portion of the shale bedrock and will be used as a downgradient monitoring point for groundwater occurring in bedrock, where the bedrock is likely in contact with landfill waste.

- Wells MW-13B, MW-20, MW-21P, MW-22P, and MW-24 are located adjacent to the western, downgradient boundary of the landfill. These wells are screened within the upper portion of the shale bedrock and will be used as downgradient sampling points for groundwater occurring in the bedrock, where the bedrock is likely in contact with landfill waste.

Table 3-1 presents a summary of the proposed monitoring well network and includes the elevation of the top of the well casing, well depth, elevation of the screened interval, elevation of the bottom of the well, the unit that the well will monitor, and the location of the well relative to the landfill.

3.2 MONITORING WELL INSTALLATION

Wells MW-1A, MW-12, and MW-14 were installed by RMT in 1991. Wells MW-19, MW-20, MW-21, MW-21P, MW-22, MW-22P, and MW-23 were installed by RMT in November 1993. All of the monitoring wells installed by RMT were installed using the procedures outlined in the Groundwater Sampling Plan (RMT, 1992). Four additional wells (MW-4B, MW-13B, MW-24, and MW-25) were installed by WESTON in March 1995, using the procedures outlined in Section 4.2 of this plan. Boring logs and well construction details for each monitoring well in the proposed monitoring network are provided in Appendix B.

3.3 BACKGROUND GROUNDWATER QUALITY

Pursuant to Paragraphs C(1) and C(2) of OAC 3745-65-92, the entire monitoring network was sampled during the initial year of groundwater monitoring, and the groundwater was

Table 3-1

Monitoring Well Network
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Well Number	Top of Inner Casing (TOC) Elevation (ft. SL)	Well Depth from TOC (ft.)	Well Bottom Elevation (ft. MSL)	Screened Internal Elevation (ft. MSL)	Stratigraphic Unit Monitored	Relative Position
MW-1A	1,126.09	42.59	1,083.50	1,093.50 - 1,083.50	Shale	Upgradient
MW-14	1,131.18	62.80	1,068.38	1,078.38 - 1,068.38	Shale	Upgradient
MW-19	1,141.16	34.70	1,106.46	1,116.46 - 1,106.46	Shale	Upgradient
MW-23	1,107.81	27.55	1,080.26	1,090.26 - 1,080.26	Mine Spoils	Upgradient
MW-4B	1,085.76	25.22	1,060.54	1,070.54 - 1,060.54	Mine Spoils	Downgradient
MW-12	1,087.94	37.50	1,050.44	1,060.44 - 1,050.44	Mine Spoils	Downgradient
MW-13B	1,106.80	32.30	1,074.50	1,084.50 - 1,074.50	Shale	Downgradient
MW-20	1,113.21	41.50	1,071.71	1,081.71 - 1,071.71	Shale	Downgradient
MW-21	1,101.12	32.60	1,068.52	1,078.52 - 1,068.52	Mine Spoils	Downgradient
MW-21P	1,101.12	67.31	1,033.81	1,038.81 - 1,033.81	Shale	Downgradient
MW-22	1,091.01	22.11	1,068.90	1,078.90 - 1,068.90	Mine Spoils	Downgradient
MW-22P	1,091.23	67.10	1,024.13	1,029.13 - 1,024.13	Shale	Downgradient
MW-24	1,110.96	45.22	1,065.74	1,075.64 - 1,065.74	Shale	Downgradient
MW-25	1,095.39	30.30	1,065.09	1,075.09 - 1,065.09	Mine Spoils	Downgradient

analyzed to establish background groundwater quality for the facility. Groundwater was sampled for the water quality and indicator parameters included on Table 3-1 of the Groundwater Sampling Plan (RMT, 1992), volatile organic compounds (VOCs), and Appendix IX Metals. As a result of these analyses and a review of the waste constituents, a list of proposed analytical parameters was submitted to OEPA in a draft Closure Plan (RMT, 1994). Subsequent to this submittal, ASF and the OEPA have agreed upon a final analytical list for the monitoring program. In accordance with the sampling approach presented to OEPA in a 27 April 1995 meeting, the groundwater monitoring program will include the semi-annual sampling of all monitoring wells included in the monitoring network for the parameters listed in Table 3-2.

The initial four quarters of groundwater analytical data for these parameters have been used to provide a statistical background set from which to make comparison of future groundwater quality during the post-closure period. Since the uppermost groundwater-producing zone varies between two different type of strata (i.e., mine spoils and shale bedrock), the chemistry of the groundwater is also highly variable. For this reason, two corresponding sets of background data have been established. One background data set has been established for the upgradient mine spoils well (MW-23), and one set has been established for the upgradient shale bedrock wells (MW-1A, MW-14, and MW-19).

Background sampling was completed in December 1993, March 1994, June 1994, and September 1994. In addition, data collected during the first semi-annual detection monitoring sampling event (March 1995) was added to the statistical background data set for shallow background well MW-23, to increase the statistical base from which to calculate background groundwater quality for the mine spoils unit.

3.4 DETECTION MONITORING

In accordance with the requirements of OAC 3745-65-91 and 3745-65-92, a detection monitoring program will be implemented at the facility. The following subsections provide details concerning the implementation of this program.

Table 3-2

Sampling and Analysis Program
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Parameter	Sampling Frequency
Arsenic	Semi-annually
Barium	Semi-annually
Cadmium	Semi-annually
Chromium	Semi-annually
Cobalt	Semi-annually
Fluoride	Semi-annually
Iron	Semi-annually
Lead	Semi-annually
Manganese	Semi-annually
Mercury	Semi-annually
Nickel	Semi-annually
Selenium	Seminannually
Silver	Semi-annually
Zinc	Semi-annually
Chloride	Semi-annually
Sulfate	Semi-annually
Total phenolics	Semi-annually
pH*	Semi-annually
Specific Conductance*	Semi-annually

*Field measured.

The detection monitoring program will involve the semi-annual sampling of all 14 wells in the monitoring well network (Figure 3-1) for the parameters listed in Table 3-2. Statistical analyses of groundwater data will be conducted upon receipt of the data from the laboratory. In accordance with OAC 3745-65-94(a)(1), the results of semi-annual sample analyses, the associated groundwater surface elevation measurements, and the statistical analysis required by OAC 3745-65-93 will be retained at the facility throughout the post-closure care period. In accordance with OAC 3745-65-94(A)(2)(b), this information will be reported to OEPA annually in accordance with the reporting requirements of OAC 3745-65-75.

In accordance with OAC 3745-65-93(C)(1), if the statistical analyses of upgradient wells indicate there has been a significant increase (or pH decrease) in the indicator parameters, this information will be reported annually in accordance with OAC 3745-65-94(A)(2)(b). In accordance with OAC 3745-65-93(C)(2), if the statistical analyses of downgradient wells indicate there has been a significant increase (or pH decrease) in the indicator parameters, the following steps will be followed:

- ASF will immediately resample the affected wells for those parameters in question to verify the previous results.
- In accordance with OAC 3745-65-93(D)(1), if the analyses confirm the statistically significant change in the indicator parameters, ASF will provide written notice to the OEPA within seven working days of the date of confirmation.
- In accordance with OAC 3745-65-93(D)(2), within 15 working days from the date of notification, ASF will develop and submit to OEPA a specific Groundwater Quality Assessment Monitoring Program (GWQAP) plan for the facility. The contents of this plan will satisfy the requirements of OAC 3745-65-93. The purpose of the GWQAP will be to determine the nature, extent, and rate of migration of contaminants.

3.5 ASSESSMENT MONITORING PROGRAM

In accordance with the requirements of OAC 3745-65-93, an outline of a Groundwater Quality Assessment Monitoring Program was completed and is included as Appendix C.

This outline describes a more comprehensive groundwater monitoring program than that described previously in Section 3.3.2. The Assessment Monitoring Program will involve the sampling of existing monitoring wells to determine the nature and extent of groundwater contamination. Additional soil borings and/or groundwater monitoring wells may be installed, if necessary, to delineate the extent of contamination. All samples will be analyzed for the indicator parameters that indicated a statistically significant change in groundwater quality had occurred. Within 15 days of receipt of the groundwater analytical data, ASF will submit a groundwater assessment report summarizing the findings of this investigation. Groundwater samples will then be collected on a semi-annual basis to monitor the extent of contamination. If the initial sampling of the network indicates that the groundwater quality has normalized, ASF will petition the OEPA to return to detection monitoring. If the analytical results from this sampling confirm the presence of any contaminants, a determination will be made as to their origin and extent. If contaminants are determined to be present, ASF will submit a corrective measures study (CMS) within 180 days after making the first determination of the contaminants' presence.

3.6 STATISTICAL ANALYSIS

The statistical method that is proposed for this program includes the calculation of tolerance intervals. With this approach, future groundwater sampling results from each well will be compared to the tolerance intervals calculated for specific indicator parameters. If the analytical results for a particular constituent within a downgradient well exceed the upper tolerance level (or the lower tolerance level for pH), this will indicate that a statistically significant change in groundwater quality may have occurred. Table 3-3 presents the upper tolerance levels calculated for each indicator parameter. The statistical procedures to be initiated as part of this evaluation are described in detail in Appendix D.

3.7 REPORTING REQUIREMENTS

In accordance with the requirements of OAC 3745-65-76, a single copy of an annual report will be prepared and submitted to the OEPA by March 1 of each year. The report will be

Table 3-3

Summary of Upper Tolerance Levels
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Parameter	Bedrock Monitoring Wells (mg/L)	Mine Spoils Monitoring Wells (mg/L)
Arsenic	0.006	0.006
Barium	0.10	0.10
Cadmium	0.0036	0.012
Cobalt	0.048	0.10
Chromium	0.03	0.004
Fluoride	1.65	0.326
Iron	36.6	24.0
Lead	0.006	0.006
Manganese	3.1	6.63
Mercury	0.0004	0.0004
Nickel	0.095	0.080
Selenium	0.08	0.006
Silver	0.002	0.002
Zinc	0.2	0.137
Chloride	349.45	411.1
Sulfate	13,886.5	1,741.2
Total phenolics	0.26	0.005
pH*	0.96/10.1	4.61/8.35
Specific conductance**	3,072	2,135

* - pH has lower/upper tolerance levels, reported in standard units (S.U.s).
** - Specific conductance is reported in μmhos/cm.

completed using the form and instructions supplied by the OEPA. This annual report will cover facility activities completed during the previous calendar year and will include, but not be limited to, the following information:

- The U.S. EPA identification number, name, and address of the facility.
- The calendar year covered by the report.
- Monitoring data required under paragraphs (A)(2)(b), (A)(2)(c), and (B)(2) of OAC 3745-65-94, as amended by this groundwater monitoring plan.

SECTION 4
GROUNDWATER SAMPLING AND ANALYSIS PLAN

In accordance with the requirements of OAC 3745-65-92, this Sampling and Analysis Plan (SAP) has been developed and incorporated into the groundwater monitoring plan. This SAP presents the standard operating procedures that will be implemented during the completion of any activities at the facility. These activities that include those completed in accordance with the Detection Monitoring Program (i.e., groundwater measurement, groundwater sampling, etc.) and the Groundwater Quality Assessment Program outlined in Subsection 3.4.

The scope of the monitoring programs will include the sampling of groundwater monitoring wells. Completion of these programs can also include the drilling of additional soil borings to facilitate the collection of discrete soil samples for laboratory analysis or the installation of additional monitoring wells. The following subsections provide detailed descriptions of the protocols to be followed during any of the following tasks:

- Drilling of soil borings.
- Installation of groundwater monitoring wells.
- Monitoring well development.
- Groundwater sample collection.
- Laboratory analysis.
- Decontamination of equipment.
- Waste management.

4.1 SOIL BORING INSTALLATION PROCEDURES

4.1.1 Drilling Procedures

All soil borings will be advanced with a truck-mounted drill rig utilizing the following procedures:

- The working end of the drill rig and all drilling equipment, tools, and materials will be decontaminated in accordance with Subsection 4.5 prior to drilling at each location with a pressurized steam cleaner. Provisions will be made to keep equipment, tools, and materials from coming into contact with surface soils during drilling and well installation.

- The soil borings will be advanced to the established sampling depths, utilizing 4.25-inch inner diameter hollow-stem augers.

- Sampling will be conducted at each boring location using standard split-spoon sampling techniques. Split-spoon samplers will be advanced ahead of the lead auger to ensure collection of an undisturbed soil sample.

- Each split spoon will be decontaminated in accordance with the standard decontamination protocol for sampling equipment outlined in Subsection 4.5.

4.1.2 Soil Sampling Procedures

Each VOC soil sample will be collected as a discrete "grab" sample from each 2-foot split spoon (or barrel auger). The only composite soil samples consisting of grab samples between different split spoons will be those samples collected for analysis of non-volatile parameters. The split spoon will be advanced by a standard 140-pound rig hammer.

Following removal from the borehole, the split-spoon will be opened on a clean surface. A portion of soil from the center of the soil core will immediately be transferred to 4-ounce jar and held for possible laboratory analysis for VOCs (depending upon the results of field screening, as described within Subsection 4.1.4). The sample will be placed into the jar in such a fashion as to reduce headspace to the fullest extent possible. The jar will then immediately be placed into an iced cooler.

The upper end (typically 2 to 3 inches) of the split-spoon core will be discarded to reduce potential cross-contamination. Another central portion of the soil core will be taken for VOC headspace screening purposes, as described within Subsection 4.1.4.

If a sample is to be collected for PAH or metals analysis, the remainder of the core will be placed into a decontaminated stainless steel or dedicated plastic or aluminum bowl, and it

will then be homogenized using a spoon or spatula. The homogenizing process will be considered complete when the soil appears to have the same properties throughout (e.g., color and texture). When homogenization is complete, the sample material will placed into the appropriate sampling containers.

All reusable sampling equipment, including the stainless steel spatulas, split spoons, spoons, mixing bowls, and trays, will be decontaminated between the collection of each sample, according to the protocol outlined in Subsection 4.5.

4.1.3 Subsurface Characterization

Each split-spoon soil sample will be described by a qualified geologist utilizing the Unified Soil Classification System (USCS). All soil descriptions will be recorded onto a WESTON boring log to create a detailed record of the lithology and potential contaminant characteristics of each boring. Descriptions will be provided of any fill materials, odors, discoloration, or staining suggesting the presence of contamination. Field screening results will also be recorded onto the log.

4.1.4 Field Screening

Each soil sample recovered will be screened using either a photoionization detector (PID) or an organic vapor analyzer (OVA), in accordance with the following protocols:

- Upon opening the split spoon, a representative sample will be placed into an 8-ounce glass jar, as well as into appropriate laboratory sample jars.
- The 8-ounce glass jar to be used for screening will be covered with heavy-gauge aluminum foil and will then be capped.
- The sample will be allowed to equalize to room temperature (approximately 70°F). If outside ambient temperature is 40°F or less, the sample will be allowed to equilibrate for a minimum of 40 minutes.
- The sample will then be shaken for a minimum of 30 seconds.

- The probe of the PID or OVA will then be inserted through the aluminum foil to a point halfway between the foil and the sample. The peak instrument reading will then be recorded.

To ensure proper operation, the field screening instrument will be calibrated each morning prior to use, according to manufacturer's specifications. Response of the unit will be routinely monitored for aberrant behavior that may suggest operational malfunction.

4.2 INSTALLATION OF GROUNDWATER MONITORING WELLS

Upon completion of a soil boring, a 2-inch PVC groundwater monitoring well will be installed using the following procedures:

- The monitoring well will be constructed of 2-inch diameter Schedule 40 PVC piping and screen materials, with flush-threaded couplings and end caps. Well screens will be 5 feet in length, unless otherwise noted, and will be constructed of PVC with continuously slotted openings of 0.010 inches.

- The annular space around the screen will be filled with a clean silica sand. Filter pack material will consist of clean 95 percent silica sand that is well rounded and has a uniformity coefficient of 2.5 or less, based on the use of the 0.010-inch slotted well screen. The sand pack will extend 1 to 2 feet above the top of the screen. Sand pack placement will be measured with a weighted tape.

- After the filter sand pack is in place, the screen will be sealed from the surface. The seal will consist of at least 2 feet of bentonite pellets placed directly above the sand pack. The bentonite pellets will be hydrated with potable water for a period of approximately 15 minutes.

- The remaining annular space will be filled with a cement-bentonite grout (Portland Type I/II cement plus 5 percent bentonite powder) placed with a tremie pipe.

- The riser pipe will extend to approximately 2.5 feet above the ground surface and will be fitted with a slip cap.

- A concrete pad will be installed at the ground surface around each of the monitoring wells. The pads will be made of ready-mix concrete and will be sloped away from the well to provide a water runoff-diversion.

- To provide well protection, a steel casing with locking cap will be installed over the PVC well casing. This protective casing will be embedded approximately 2 feet from grade into the cement bentonite grout before the grout has had time to set. Key-alike locks will be provided for each protective casing.

4.3 MONITORING WELL DEVELOPMENT

After installation of all the monitoring wells, each well will be developed using the following procedures:

- All equipment to be introduced into the well will be decontaminated in accordance with procedures outlined in Subsection 4.5.
- The initial static water level and total depth of the well will be recorded. Well and filter pack volume will be calculated and recorded.
- During purging, measurements of pH, specific conductance, and temperature will be recorded. Purging will continue until these measurements have stabilized for three successive readings within 5 percent of each measurement, or until a maximum of five casing values has been removed.
- The volume of water removed from each well, the purging time, and stabilization measurements will be recorded.

Wells will be alternatively surged and purged. The surge and purge cycle shall consist of several minutes of surging followed by several minutes of purging to remove the material collecting in the bottom of the well. The surging shall be accomplished by using a bailer or surge block.

4.4 GROUNDWATER SAMPLE COLLECTION

Groundwater monitoring wells will be sampled using the following procedures:

- Upon removing the protective cap to the monitoring well riser, the headspace will be screened for the presence of volatile organic vapors. The purpose of this screening is strictly for health and safety monitoring, not for characterization. The measured values will be recorded in the field log book.

- The depth to the water level and the total depth of the well will be measured with an electrical sounding device (accuracy +/- 0.01 feet). The depth to water and the time of measurement will be recorded. The reference point for these depths will be the top of the PVC casing of the well.

- The volume of standing water in the well will be calculated.

- A bailer or pump will be used to purge each well. A minimum of three purge volumes and a maximum of five purge volumes will be removed before sampling.

- At the completion of each well volume removed, field measures of pH, specific conductance, and temperature will be taken. These values will be recorded in the field notebook.

- After removing the third volume, purging will cease when measurements for all three parameters have stabilized within 5 percent of each measurement for three consecutive readings or after five well volumes have been removed.

- In the event that the monitoring well purges dry before three volumes have been removed, the well will be allowed to recharge for 15 minutes and will then be pumped dry again.

- A dedicated disposable bailer will be used to collect groundwater samples from each well.

- Samples will be collected directly from each bailer. If the well purges dry, a water sample will be collected after the well is purged dry a second time.

- After collection, samples to be analyzed for soluble metals will be field filtered using a disposable filtration devise equipped with a 0.45-micron filter. Samples will be filtered directly into the laboratory sample container and will be preserved using the appropriate sample preservative.

- After the samples are collected, they will be placed on ice in a cooler for preservation. Chain-of-custody documentation will be completed for each cooler, and the samples will then be delivered to the laboratory.

4.4.1 Sample Documentation and Tracking

Field observations and other information pertinent to the collection of samples will be recorded in the field. All entries will be made in a bound logbook with black or blue ink. Logbooks will be identified by unique sequential numbers. The data to be recorded for

each sample will include date, time (i.e., 24-hour time reference), sample number, sample location, and name(s) of the person(s) collecting the sample. In addition, general information will be recorded into the logbook daily, including the personnel present at the site, the level of protection being worn, and the weather conditions. Photographs will be taken and logged to document sampling activities.

4.4.2 Sample Documentation Forms

The main sample documentation form is the chain-of-custody (COC) form (also called the Custody Transfer Record/Lab Work Request Form). In addition, sample container labels will be used. The important protocols associated with the use of these forms are summarized below:

- Each shipment container will be accompanied by a COC form documenting the contents of the shipment container. The information on the COC form will include project sample identification numbers, sample matrix, sample collection date, analysis required, type and number of sample containers per sample, and preservatives (if any).
- Every sample in the associated shipment container will be documented on the COC form.
- The project name and associated project work order number will also be written on the COC form.
- The field leader will sign and date the COC form as the relinquisher of the samples to the shipment courier.
- The carrier service is not required to sign the COC form if the COC seals remain intact. The airbill number and the COC seal numbers will be written on the COC form.

Examples of the sample COC forms and the sample container labels are provided in Appendix E.

4.4.3 Sample Packaging and Shipment

All samples must be shipped in accordance with U.S. Department of Transportation (DOT) regulations. If they are sent by air transportation, all samples must be shipped in accordance with the International Air Transport Association (IATA) Dangerous Goods regulations.

Following sample collection, the exteriors of all sample containers will be wiped clean with a moist cloth. The filled sample containers will not be sprayed with water during decontamination, because this water could contact the sample if the container is not tightly sealed. In preparation for shipment to the analytical laboratory, all samples will be packaged in accordance with the following procedures:

- Each sample container will be checked to ensure that the container lid is securely tightened.
- Each sample container will be checked to ensure that the sample label has been securely affixed to the container and is completely and correctly filled out with the appropriate sample I.D. number, sample date, sample time of collection, and analytical parameters, as minimum requirements.
- If a sample is deemed a "dangerous good" and is being shipped via air transportation, it will be packaged in accordance with the IATA Dangerous Goods Regulations, based on the classification of the sample. If neither of the above conditions apply, the samples will be placed in a shipment container. In both scenarios, enough vermiculite or equivalent absorbent material will be packed around the samples to minimize the possibility of container breakage. The temperature will be maintained at 4° C with cold packs or ice. The remaining space in the shipment container will be filled with additional packing material.
- The completed COC form identifying the contents of the sample shipment container will be placed in a large zip-lock bag and taped to the inside lid of the shipment container (the sampler's copy of the form will first be removed).
- The lid of the shipment container will be closed and sealed shut with strapping tape. If the shipment container has a drain port, it will also be sealed shut with tape.

- The shipment airbill will be affixed to the top of the container and will identify the shipper's and recipient's names and addresses. A mailing label will also be affixed to the top of the shipment container and will contain the same information as the airbill, in case the airbill becomes detached from the container during shipment.

- "This Side Up" arrows will be placed on all the four sides of the shipment container.

Sample handling, packaging, and shipment activities are the responsibility of the field leader. The Field Leader will provide the project manager with the retained copies of the COC forms and airbills.

4.4.4 Laboratory Analytical Protocols

Groundwater samples collected during the monitoring program and soil samples that may be potentially collected in the future will be submitted to a U.S. EPA-certified laboratory. Turnaround times for analytical results will be approximately three weeks (standard turnaround). All analytical results will be validated by a chemist in accordance with applicable U.S. Environmental Protection Agency (U.S. EPA) procedures.

After the initial year, the primary monitoring wells will be sampled semi-annually for the indicator parameters (Table 3-2).

ASF will use a commercial laboratory to conduct analyses of groundwater samples. The laboratory chosen to conduct the analyses will utilize only U.S. EPA-approved and/or proposed instrumentation, methods, quality control procedures and standard laboratory practices outlined in the following U.S. EPA analytical method manuals and guidance documents:

- EPA/SW-846, "Test Methods for Evaluating Solid Waste Physical/Chemical Methods," 1982.

- EPA/SW-846, "Proposed Sampling and Analytical Methodologies for Addition to Test Methods for Evaluating Solid Waste Physical/Chemical Methods, " 2nd Edition, July 1982.

- EPA 600/4-82-057, "Methods for Organic Chemical Analysis for Municipal and Industrial Wastewater," July 1982.

- EPA 600/4-79-02, "Methods for Chemical Analysis of Water and Wastes," March 1983.

- EPA 600/4/79-019, "Handbook for Analytical Control in Water and Wastewater Laboratories."

- EPA 330/9-79-001-R, "National Enforcement Investigation Center Policies and Procedures Manual," October 1979.

The sampling effort will include the following types of field QA/QC samples:

- Field duplicates.
- Matrix spikes/matrix spike duplicates.

Field duplicate samples will be collected at selected locations during soil sampling at a 1-per-10 sample frequency, using procedures identical to those used for the investigative samples. The field crew will determine which borings provide field duplicates. Duplicate samples will be collected by alternately filling two sets of sample bottles from the same continuous sampler at the same sample interval as the investigative sample.

Matrix spike/matrix spike duplicate samples (MS/MSDs), will be collected on a 1-per-20 sample frequency (or less) for soil samples. MS/MSD samples are not additional samples, but are instead investigative samples that undergo MS/MSD analyses.

4.5 DECONTAMINATION PROCEDURES

All equipment involved in field sampling activities will be decontaminated before and after sampling. Equipment leaving the site will be decontaminated as specified in the Health and Safety Plan (HASP). All drilling equipment and tools will be decontaminated in accordance

with the procedures outlined in Table 4-1. All sampling equipment, including trowels and split spoons, will be decontaminated in accordance with Table 4-2.

Extraneous contamination and cross-contamination will be controlled by the decontamination procedure, by wrapping sampling equipment in aluminum foil when not in use, and by changing and disposing the sampler gloves frequently. Personnel directly involved in equipment decontamination will wear protective clothing, as specified in the HASP.

4.6 WASTE HANDLING PROTOCOLS

All liquid or solid wastes generated during the completion of any activities at the facility will be containerized in 55-gallon drums. Subsequently, these materials will be characterized and disposed of in accordance with all applicable state and federal regulations.

Table 4-1

Standard Decontamination Protocol for Drilling Equipment
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Step	Task
1	The drilling rig or other equipment/materials will be moved to the designated decontamination area. The decontamination area location will be selected to avoid the contamination of additional areas of the site.
2	All drilling casing and related drilling equipment will be supported aboveground and will be individually steam cleaned using a pressurized steam/water spray.
3	The control panel and working area of the drill rig will be steam cleaned if it is deemed necessary.
4	If necessary, a nonsolvent type cleaning solution such as isopropanol or Alconox detergent will be used to spot clean any areas requiring further cleaning. Scrubbing of these areas will be followed by steam cleaning to remove the residual contamination.

Note: All steam cleaning will be performed using pressurized steam on all augers, tools, sampling devices, etc., before each use on a new borehole. Steam cleaning will continue until all visible contamination, oil, grease, etc., are removed.

Table 4-2

Standard Decontamination Protocol for Sampling Equipment
American Steel Foundries
Sebring Facility
Alliance, Ohio

Step	Task
1	Equipment will be scrubbed thoroughly with soft-bristle brushes in a low-sudsing (Alconox) detergent solution.
2	Equipment will be rinsed with distilled water by submerging and/or spraying.
3	Equipment will be allowed to drip dry before use. Equipment not used for an extended period of time will be covered in aluminum foil or plastic sheeting.

APPENDIX A

HYDRAULIC CONDUCTIVITY GRAPHS AND CALCULATIONS

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-1A** **Test Type:** **Falling Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.5 ft
H = 8.4 ft
L_w = 8.4 ft
L_e = 8.4 ft
$L_e \backslash r_w$ = 16.7
C = 1.8

Graph Parameters:

y^0 = 0.83 ft
y^t = 0.01 ft
t = 6.1 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/6.1 \text{ min} \times \ln (0.83 \text{ ft}/0.01 \text{ ft})$

$= 0.72 \text{ min}^{-1}$

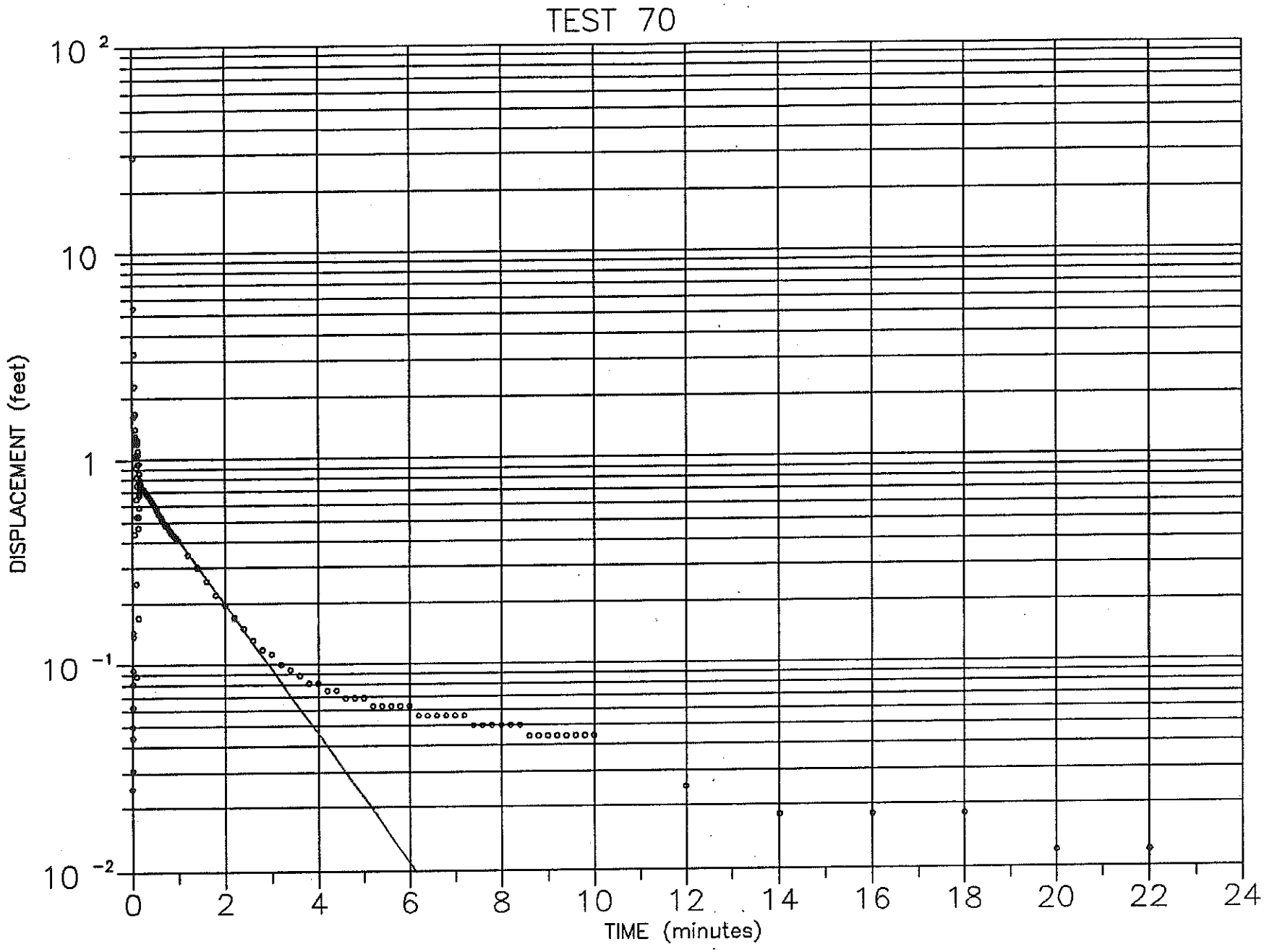
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.00$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.00}{2 \times 8.4 \text{ ft}} \times 0.72 \text{ min}^{-1}$$

$= 5.9 \times 10^{-4}$ ft/min
$= 0.85$ ft/day
$= 3.0 \times 10^{-4}$ cm/sec



MW-1A
Falling
$y^0 = 0.83$ ft.
$y^t = 0.01$ ft.
$t = 6.1$ min

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-1A** **Test Type:** **Rising Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.5 ft
H = 8.4 ft
L_w = 8.4 ft
L_e = 8.4 ft
$L_e \backslash r_w$ = 16.7
C = 1.8

Graph Parameters:

y^0 = 1.67 ft
y^t = 0.01 ft
t = 5.1 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/5.1 \text{ min} \times \ln (1.67 \text{ ft}/0.01 \text{ ft})$

$= 1.00 \text{ min}^{-1}$

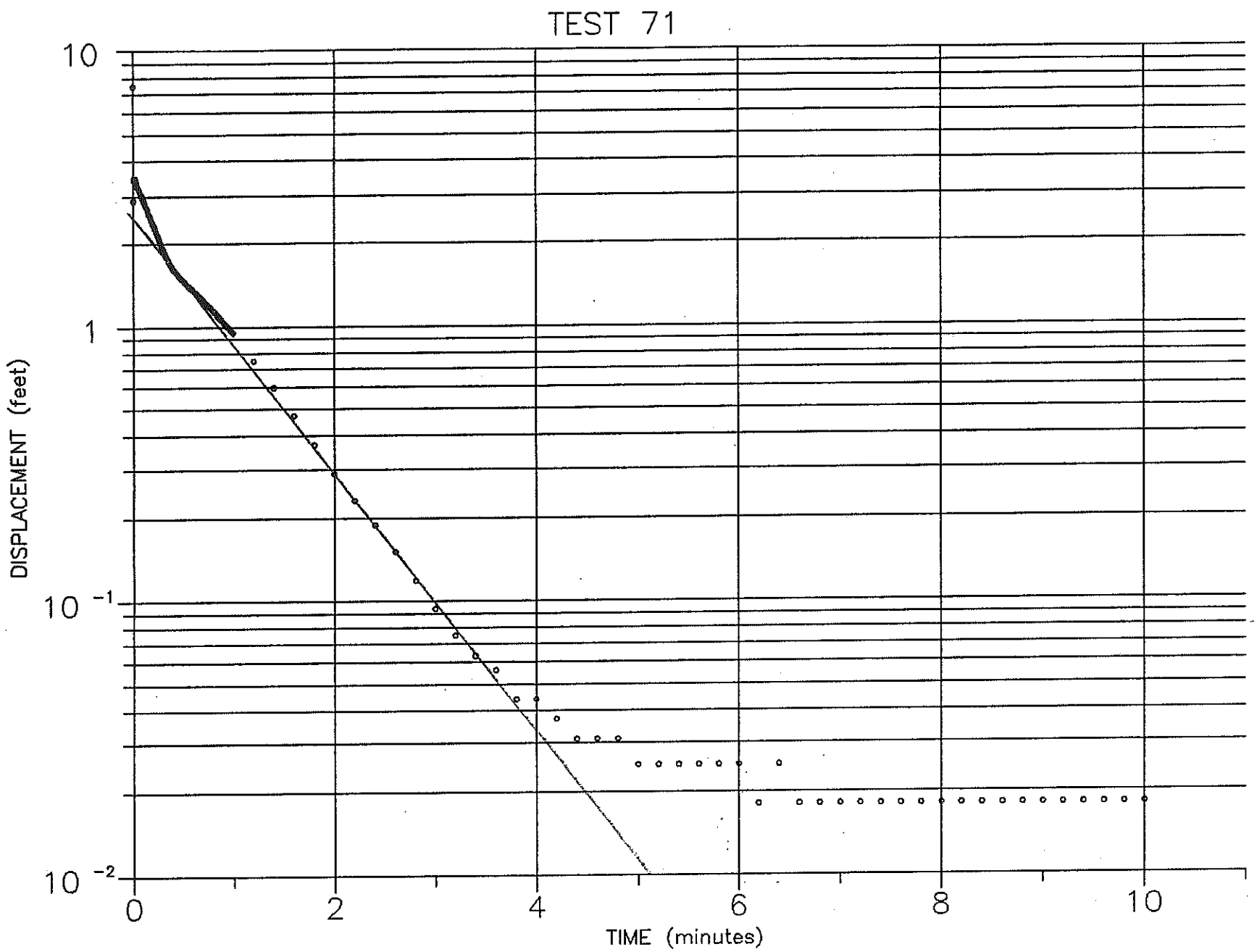
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.00$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.00}{2 \times 8.4 \text{ ft}} \times 1.00 \text{ min}^{-1}$$

$= 8.2 \times 10^{-4}$ ft/min
$= 1.2$ ft/day
$= 4.2 \times 10^{-4}$ cm/sec



MW-1A
Rising

$y_0 = 1.67$ ft.
$y^t = 0.01$ ft.

$t = 5.1$ min

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-4B** **Test Type:** **Falling Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.33 ft
H = 17.3 ft
L_w = 17.3 ft
L_e = 10.0 ft
$L_e \backslash r_w$ = 30.3
C = 2.0

Graph Parameters:

y^0 = 1.75 ft
y^t = 0.01 ft
t = 2.63 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/2.63 \text{ min} \times \ln (1.75 \text{ ft}/0.01 \text{ ft})$

$= 1.96 \text{ min}^{-1}$

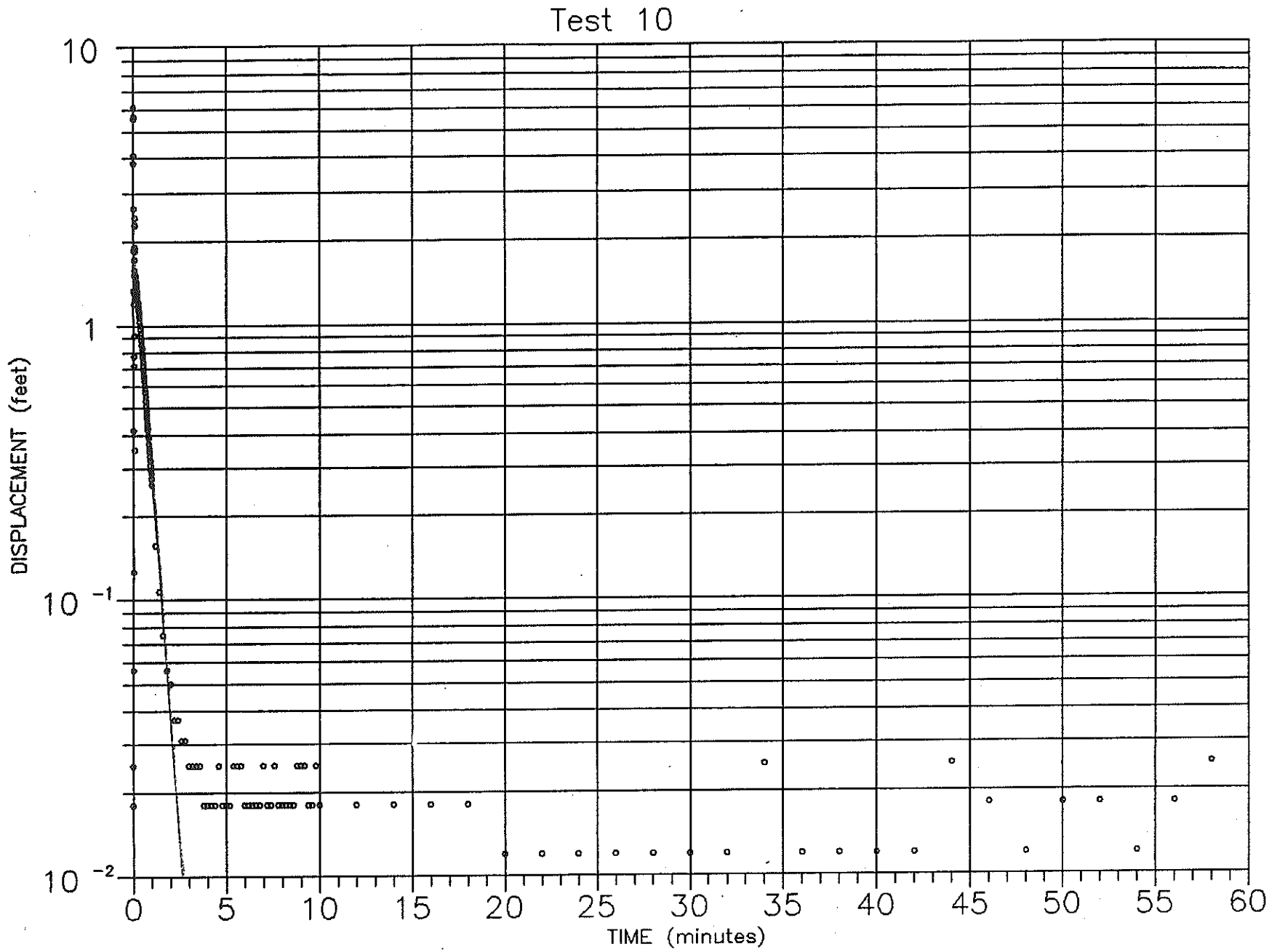
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.90$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.90}{2 \times 10.0 \text{ ft}} \times 1.96 \text{ min}^{-1}$$

$= 2.0 \times 10^{-3}$ ft/min
$= 2.8$ ft/day
$= 1.0 \times 10^{-3}$ cm/sec



MW-4B
Falling

y_0 = 1.75 ft

y_t = 0.01 ft.

t = 2.63 min

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-20** **Test Type:** **Rising Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.42 ft
H = 9.5 ft
L_w = 9.5 ft
L_e = 9.5 ft
$L_e \backslash r_w$ = 22.6
C = 1.8

Graph Parameters:

y^0 = 0.58 ft
y^t = 0.001 ft
t = 0.76 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/0.76 \text{ min} \times \ln (0.58 \text{ ft}/0.001 \text{ ft})$

$= 8.37 \text{ min}^{-1}$

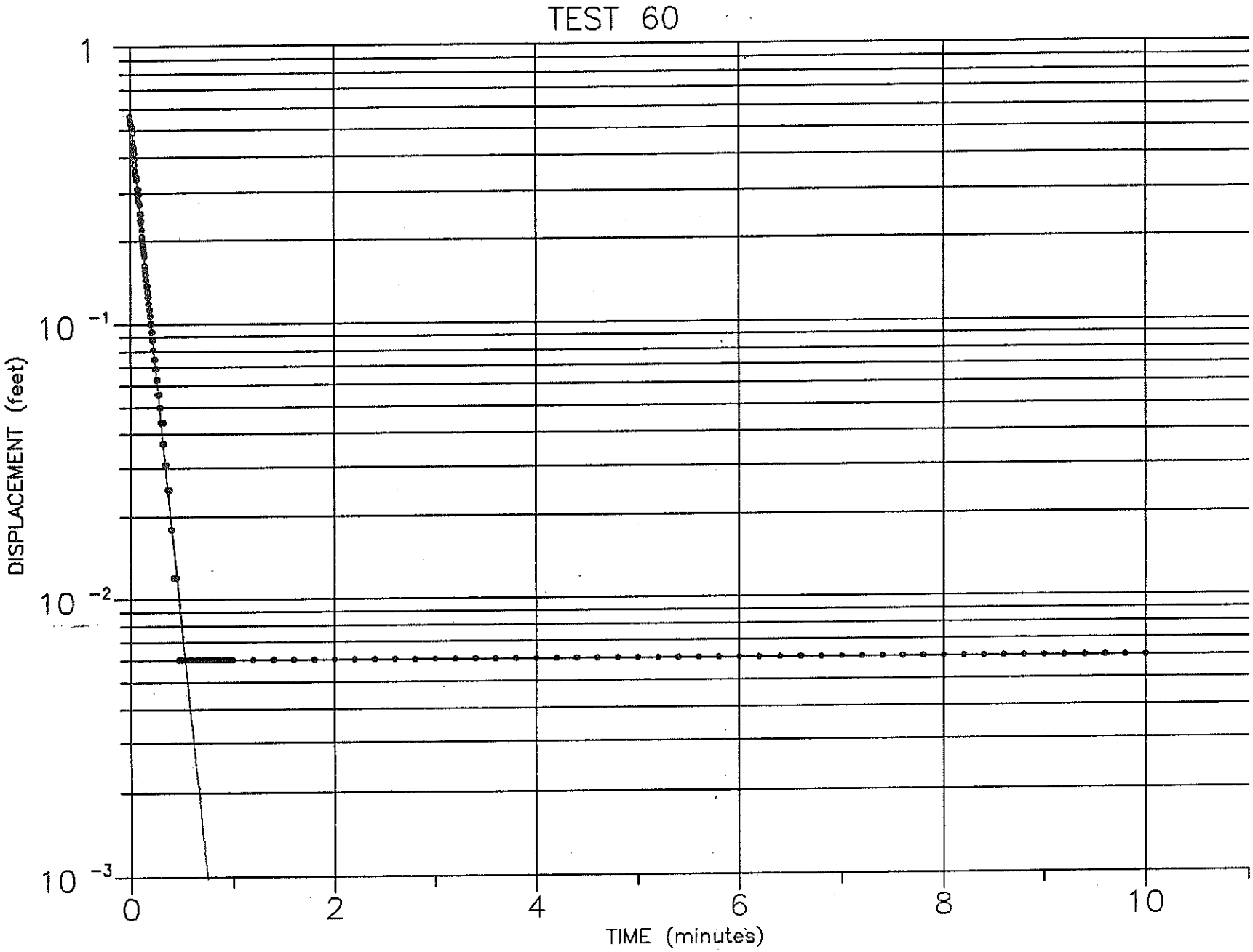
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.30$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.30}{2 \times 9.5 \text{ ft}} \times 8.37 \text{ min}^{-1}$$

$= 7.0 \times 10^{-3}$ ft/min
$= 10.0$ ft/day
$= 3.6 \times 10^{-3}$ cm/sec



MW- 20
Rising
$y^0 = 0.58'$
$y^t = 0.001'$
$t = 0.76$ min

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-21** **Test Type:** **Falling Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.42 ft
H = 10.9 ft
L_w = 10.9 ft
L_e = 10.0 ft
$L_e \backslash r_w$ = 23.8
C = 1.8

Graph Parameters:

y^0 = 4.0 ft
y^t = 0.001 ft
t = 0.81 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/0.81 \text{ min} \times \ln (4.0 \text{ ft}/0.001 \text{ ft})$

$= 10.2 \text{ min}^{-1}$

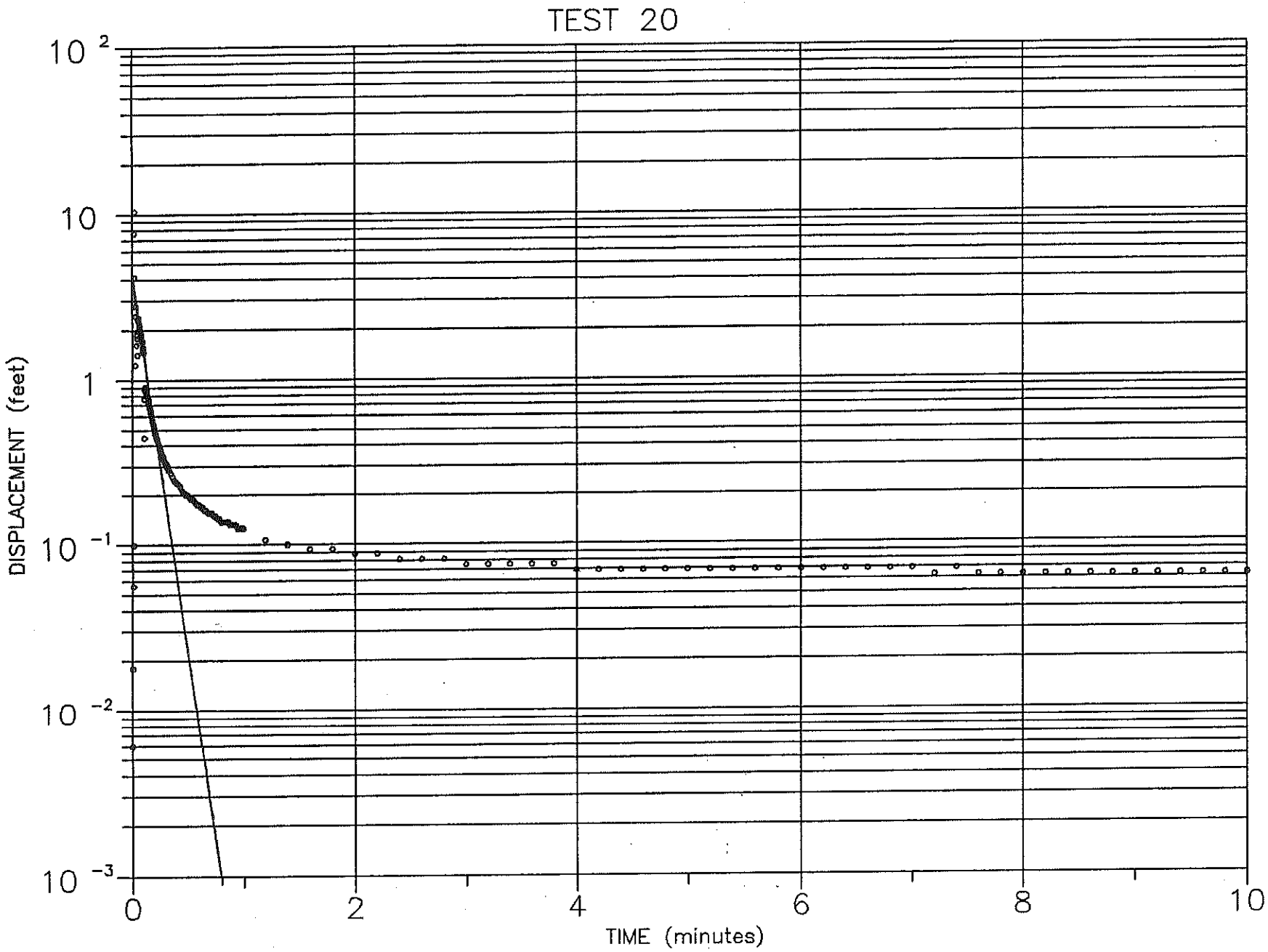
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.40$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.40}{2 \times 10.0 \text{ ft}} \times 10.2 \text{ min}^{-1}$$

$= 8.5 \times 10^{-3}$ ft/min
$= 12.2$ ft/day
$= 4.3 \times 10^{-3}$ cm/sec



MW-21
Falling
$y^0 = 4.0'$
$y^t = 0.001'$
$t = 0.81$ min

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-21P** **Test Type:** **Rising Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.42 ft
H = 45.6 ft
L_w = 45.6 ft
L_e = 5.0 ft
$L_e \backslash r_w$ = 11.9
C = 1.2

Graph Parameters:

y^0 = 1.8 ft
y^t = 1.5 ft
t = 0.8 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/0.8 \text{ min} \times \ln (1.8 \text{ ft}/1.5 \text{ ft})$

$= 0.23 \text{ min}^{-1}$

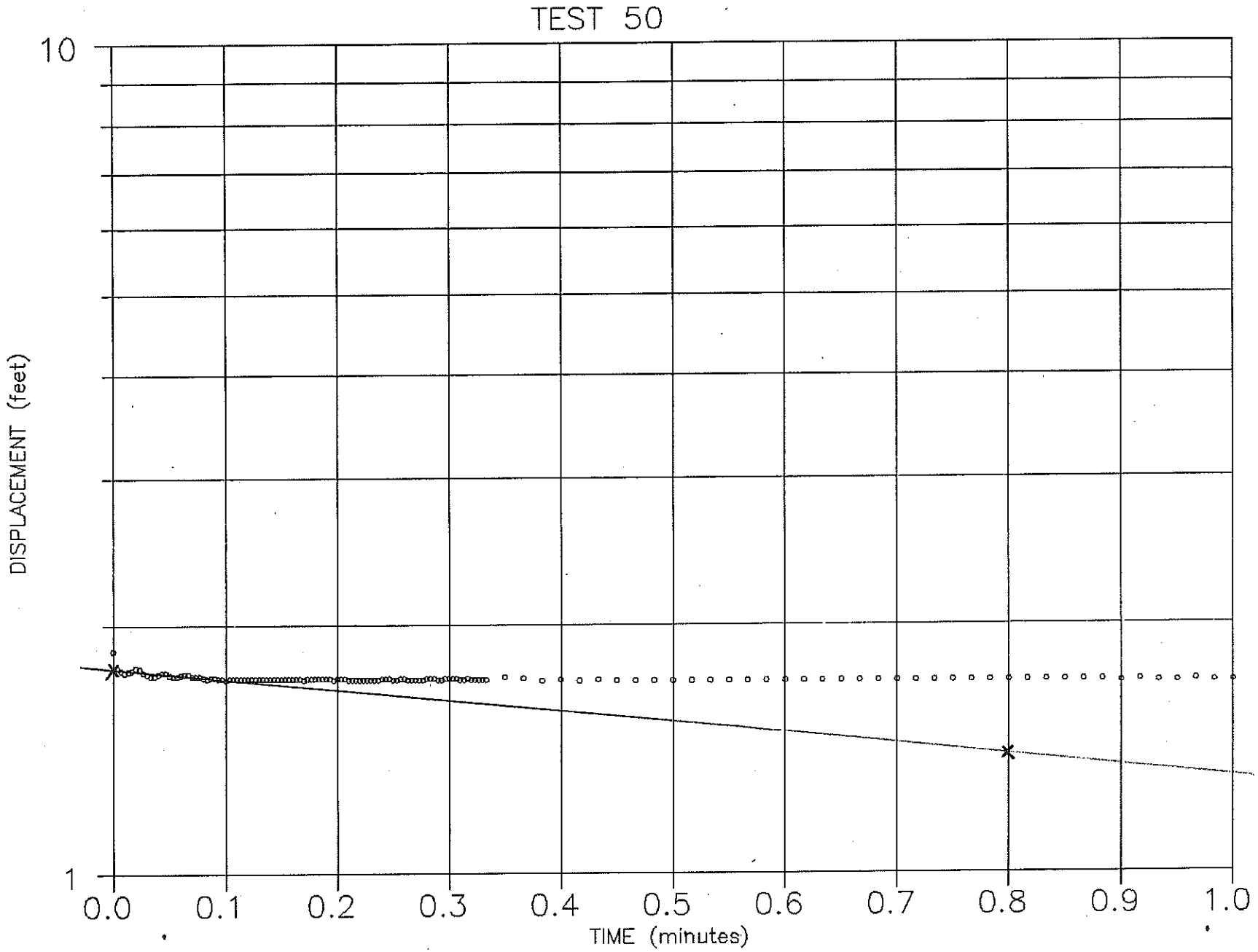
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 3.00$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 3.00}{2 \times 5 \text{ ft}} \times 0.23 \text{ min}^{-1}$$

$= 4.8 \times 10^{-4}$ ft/min
$= 0.68$ ft/day
$= 2.4 \times 10^{-4}$ cm/sec



MW-21P
Rising
$y^o = 1.8$
$y^t = 1.5$
$t = 0.8$

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-22** **Test Type:** **Rising Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.42 ft
H = 9.0 ft
L_w = 9.0 ft
L_e = 9.0 ft
$L_e \backslash r_w$ = 21.5
C = 1.8

Graph Parameters:

y^0 = 2.375 ft
y^t = 0.001 ft
t = 0.47 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/0.47 \text{ min} \times \ln (2.375 \text{ ft}/0.001 \text{ ft})$

$= 18.6 \text{ min}^{-1}$

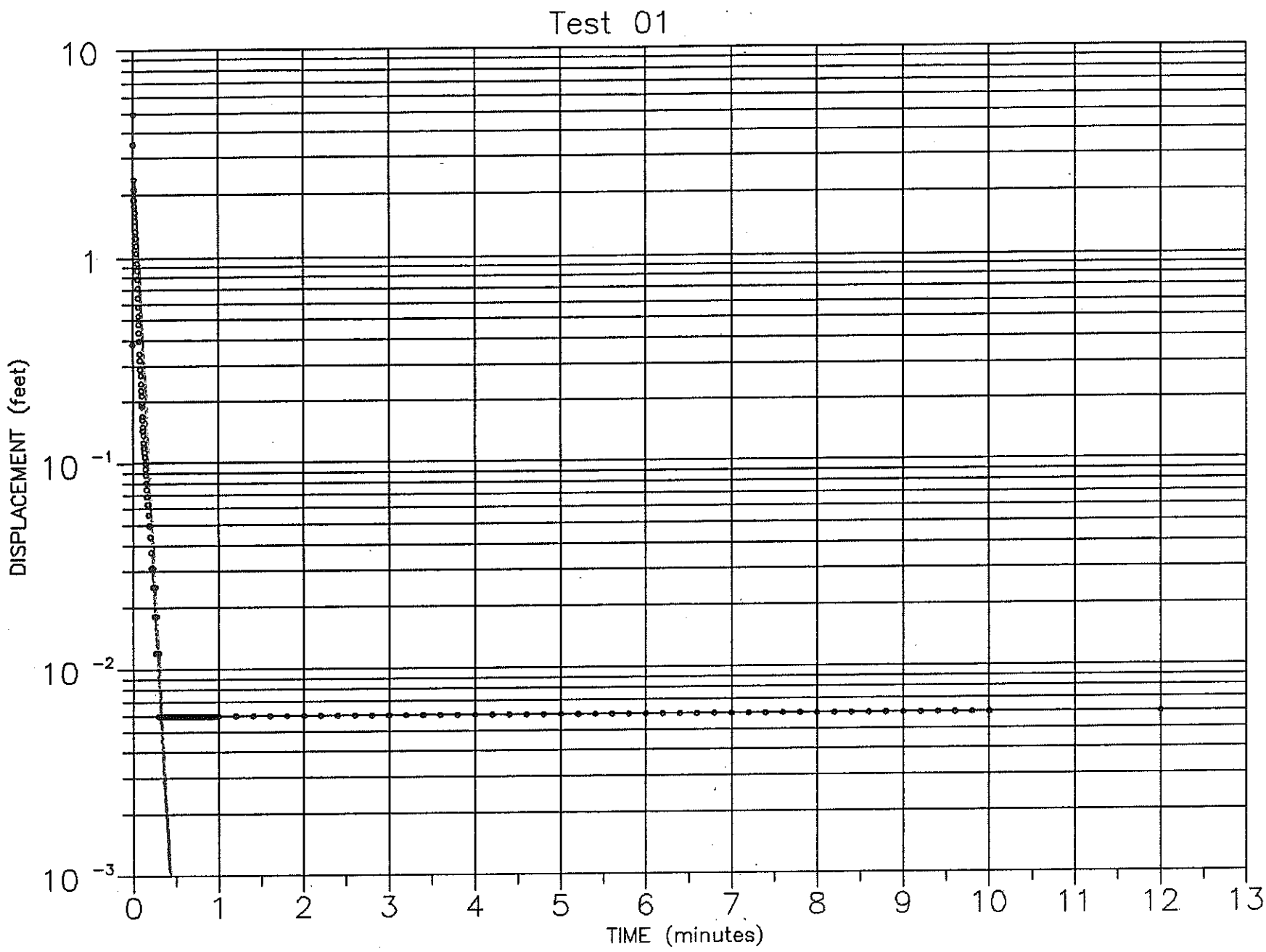
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.30$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.30}{2 \times 9.0 \text{ ft}} \times 18.6 \text{ min}^{-1}$$

= 0.016 ft/min
= 23.6 ft/day
= 8.1×10^{-3} cm/sec



mw - 22
Rising
y_0 = 2.375
y^r = 0.001'
t = 0.44 min

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-22** **Test Type:** **Falling Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.42 ft
H = 9.0 ft
L_w = 9.0 ft
L_e = 9.0 ft
$L_e \backslash r_w$ = 21.5
C = 1.8

Graph Parameters:

y^0 = 2.0 ft
y^t = 0.001 ft
t = 0.4 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/0.4\text{min} \times \ln (2.0 \text{ ft}/0.001 \text{ ft})$

$= 19.0 \text{ min}^{-1}$

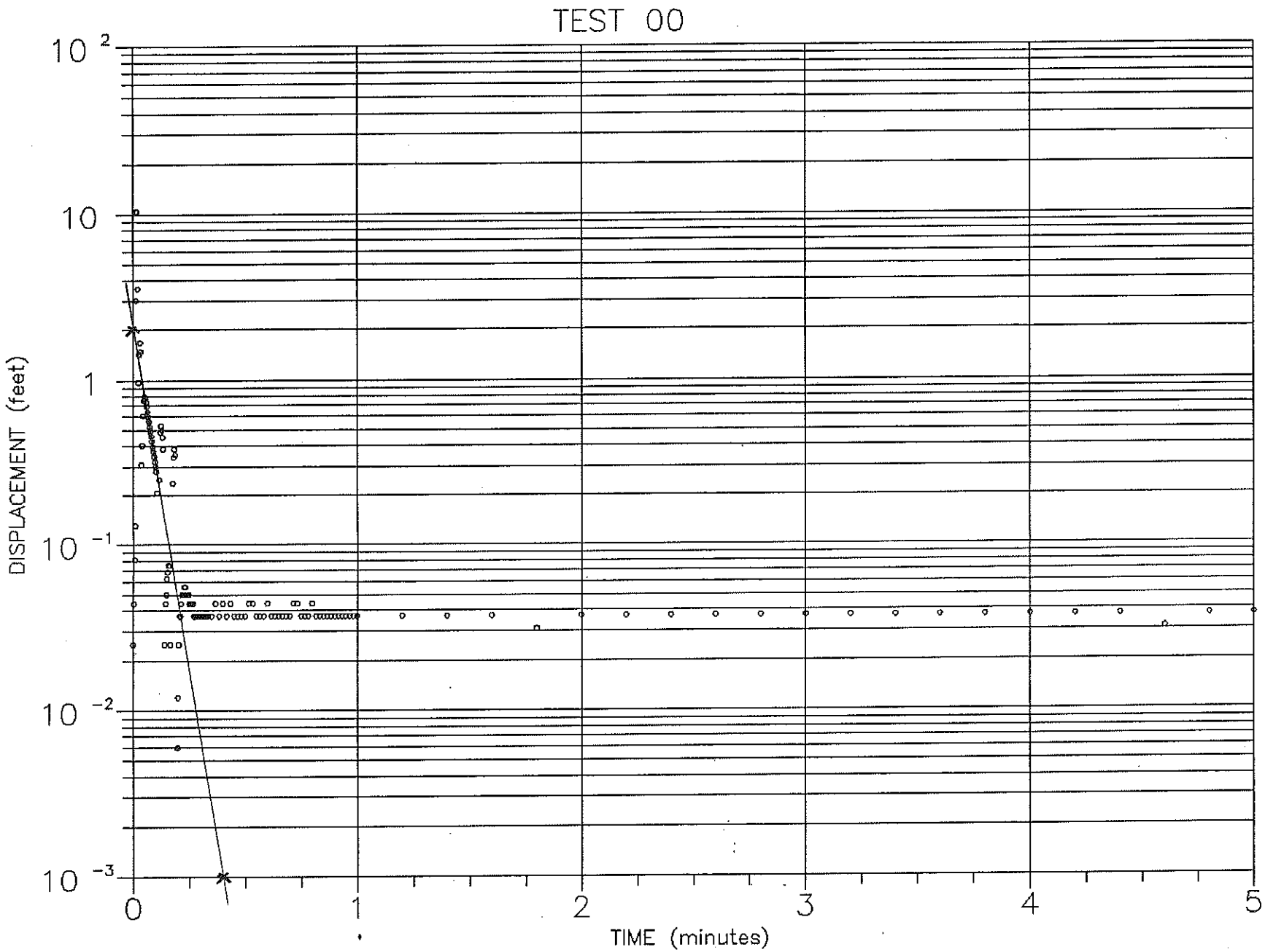
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.30$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.30}{2 \times 9.0 \text{ ft}} \times 19.0 \text{ min}^{-1}$$

= 0.017 ft/min
= 24.1 ft/day
= 8.5×10^{-3} cm/sec



MW-22
Falling

$y^0 = 2$

$y^t = 0.001$

$t = 0.4$

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-22P** **Test Type:** **Rising Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.42 ft
H = 47.7 ft
L_w = 47.7 ft
L_e = 5.0 ft
$L_e \backslash r_w$ = 11.9
C = 1.2

Graph Parameters:

y^0 = 1.9 ft
y^t = 1.0 ft
t = 1.3 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/1.3\text{min} \times \ln (1.9\text{ ft}/1.0\text{ ft})$

$= 0.5\ \text{min}^{-1}$

2. $\ln R_e \backslash r_w$

$$= \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

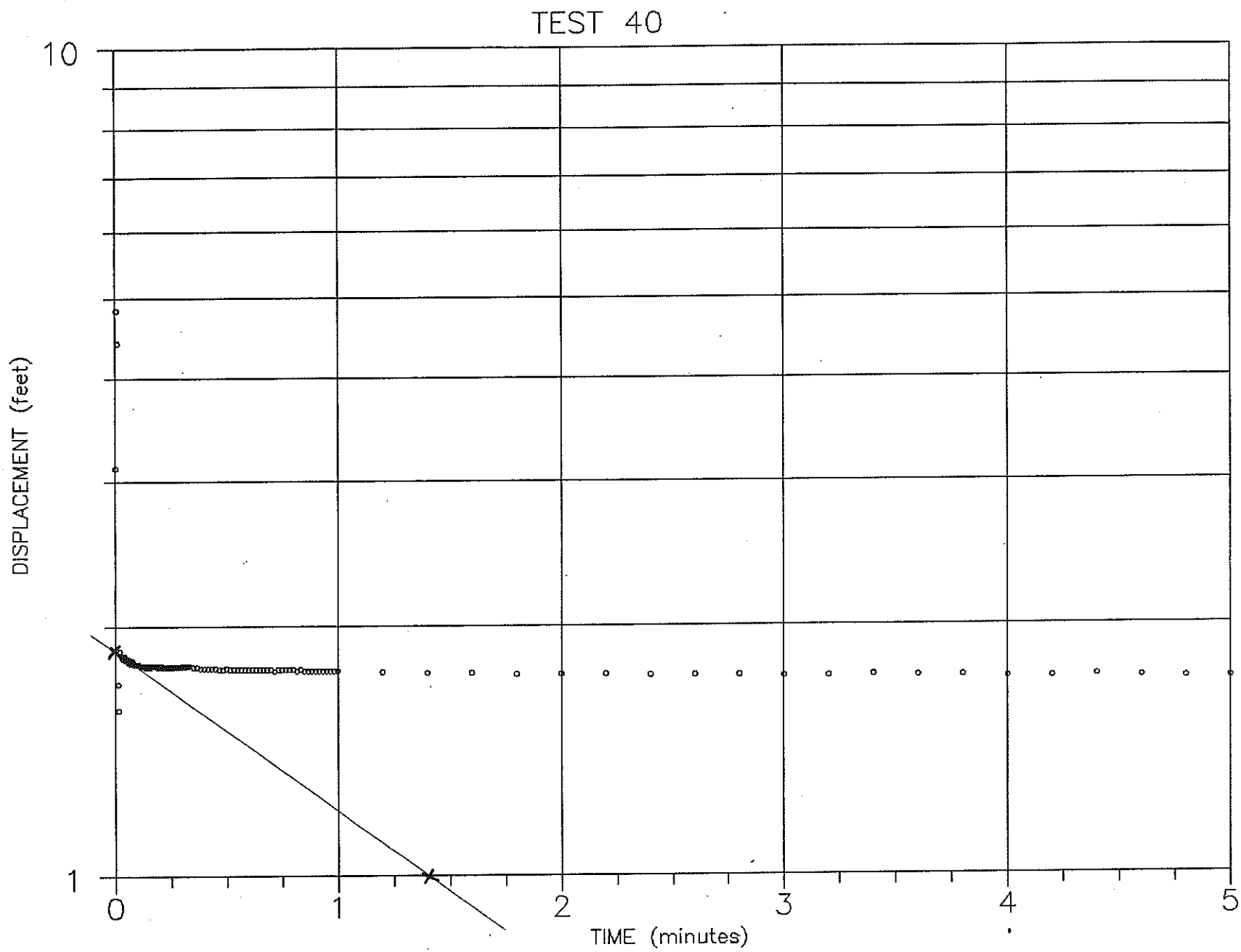
$= 3.00$

3. Hydraulic Conductivity (K)

$$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083\text{ ft})^2 \times 3.00}{2 \times 5\text{ ft}} \times 0.5\ \text{min}^{-1}$$

$= 1.0 \times 10^{-3}$ ft/min
$= 1.5$ ft/day
$= 5.3 \times 10^{-4}$ cm/sec



MW-22P
Rising
$y^0 = 1.9$
$y^t = 1.0$
$t = 1.3$

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-23** **Test Type:** **Falling Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.50 ft
H = 9.2 ft
L_w = 9.2 ft
L_e = 9.2 ft
$L_e \backslash r_w$ = 18.4
C = 1.8

Graph Parameters:

y^0 = 1.7 ft
y^t = 0.1 ft
t = 0.6 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/0.6\text{min} \times \ln (1.7\text{ ft}/0.1\text{ ft})$

$= 4.70\ \text{min}^{-1}$

2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.10$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083\text{ ft})^2 \times 2.10}{2 \times 9.2\text{ ft}} \times 4.7\ \text{min}^{-1}$$

$= 3.7 \times 10^{-3}$ ft/min
$= 5.3$ ft/day
$= 1.9 \times 10^{-3}$ cm/sec

CALCULATION OF HYDRAULIC CONDUCTIVITY
AMERICAN STEEL FOUNDRIES
SEBRING, OHIO FACILITY

Well No. **MW-24** **Test Type:** **Rising Head**

Well Geometry:

r_c = 0.083 ft
r_w = 0.5 ft
H = 14.9 ft
L_w = 14.9 ft
L_e = 10.0 ft
$L_e \backslash r_w$ = 30.3
C = 2.0

Graph Parameters:

y^0 = 2.0 ft
y^t = 0.6 ft
t = 0.4 min.

Equations:

1. Slope of best fit line $= 1/t \times \ln (y^0/y^t)$

$= 1/0.4 \text{ min} \times \ln (2.0 \text{ ft}/0.6 \text{ ft})$

$= 3.0 \text{ min}^{-1}$

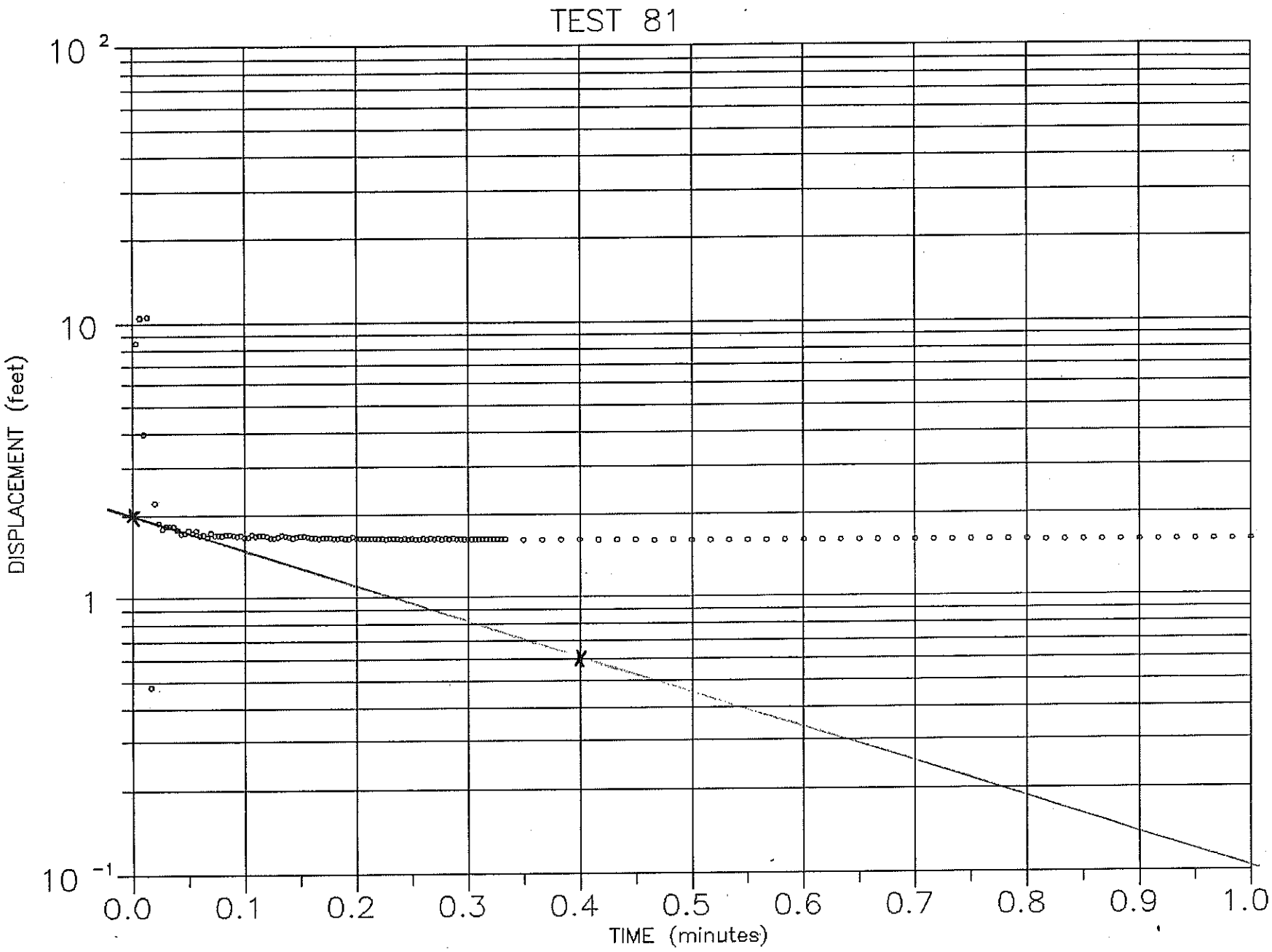
2. $$\ln R_e \backslash r_w = \left[\frac{1.1}{\ln (L_w/r_w)} + \frac{C}{(L_e/r_w)} \right]^{-1}$$

$= 2.80$

3. Hydraulic Conductivity (K) $$= \frac{(r_c)^2 \times \ln R_e/r_w}{2 \times L_e} \times 1/t \ln (y^0/y^t)$$

$$= \frac{(0.083 \text{ ft})^2 \times 2.80}{2 \times 10 \text{ ft}} \times 3.0 \text{ min}^{-1}$$

$= 2.9 \times 10^{-3}$ ft/min
$= 4.2$ ft/day
$= 1.5 \times 10^{-3}$ cm/sec



MW-24
Rising
$y^0 = 2$

$y^t = 0.6$

$t = 0.4$

APPENDIX B

DRILLING LOGS FOR THE PROPOSED MONITORING NETWORK WELLS

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION	PAGE NO.	HOLE NO.
American Steel Foundries, Alliance, Ohio	1 of 2	MW-4B

START	FINISH	DRILLER	DRILL METHOD	BOREHOLE DIAMETER	WELL DIAMETER	TOTAL DEPTH
3/7/95	3/9/95	Bowser & Morner	4 1/4" HSA	8"	2"- PVC	44.00'

LOGGER	TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED
J. Ahmed			7.94'/' 3/21/95

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
	CT									**TOPSOIL**: organics; little coarse grained gravel; slightly moist; no odor.	
1	SS	14	6 6 5 13		3			CL		**CLAY**: stiff; and fine to coarse grained subangular to angular gravel; little siltstone and shale fragments; angular; brown with gray mottling; slightly moist; no odor (**MINE SPOILS**).	SP=0, BZ=0
2	SS	8	6 9 7 11		5			CL		As above; moist; little siltstone fragments; angular.	SP=0
3	SS	13	6 5 5 6		8					**MINE SPOILS**: highly siltstone weathered; fissile; some clay and coarse fragments of shale; rusty at places; little sandstone fragments; grayish green; slightly moist; no odor.	SP=0, BZ=0
4	SS	16	4 3 5 6		10					As above; with increase in clay content; more weathered fragments of shale; slightly moist; no odor.	SP=0
5	SS	10	3 4 5 3		13					As above	SP=0, BZ=0
6	SS	16	2 3 3 4		15					At approximately 16-feet is a 3-inch coal fragments layer; wet.	SP=0
7	SS	20	3 8 5 4		18					**MINE SPOILS**: medium hardness; highly weathered shale; friable; moderately defined bedding planes; fractures present; gray; moist; no odor.	SP=0
8	SS	10	3 5 8 8		20					As above	SP=0, BZ=0
9	SS	10	7		22					As above	

*ASTM D1586 ST = SHELBY TUBE
SS = SPLIT SPOON C = CORE CS = CONTINUOUS SAMPLER
D = DENNISON CT = CUTTINGS BA =BUCKET AUG.

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION: American Steel Foundries, Alliance, Ohio

 HOLE NO. MW-4B

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
			8 8 7		24						SP=0
10	SS	11	7 9 12 11		25 26 27					**MINE SPOILS**: weathered shale; argillaceous; gray green; and siltstone angular gravel; moist.	SP=0
11	SS	10	8 10 11 13		28 29					As above	SP=0
12	SS	10	7 10 13 8		30 31 32					As above	SP=0
13	SS	14	7 8 14 14		33 34					As above	
14	SS	6	8 14 18 20		35 36 37					As above	SP=0, BZ=0
15	SS	10	8 10 12 7		38 39					As above	SP=0, BZ=0
16	SS	10	22 48 84 102		40 41					As above	SP=0, BZ=0
	CT				42 43					**SHALE**: gray; massive; hard; slightly moist.	
					44					End of boring at 44.0-feet.	

*ASTM D1586
SS = SPLIT SPOON ST = SHELBY TUBE
D = DENNISON C = CORE CS = CONTINUOUS SAMPLER
CT = CUTTINGS BA = BUCKET AUG.

American Steel Foundries
Alliance, Ohio

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION	PAGE NO.	HOLE NO.
American Steel Foundries, Alliance, Ohio	1 of 2	MW-13B

START	FINISH	DRILLER	DRILL METHOD	BOREHOLE DIAMETER	WELL DIAMETER	TOTAL DEPTH
3/10/95	3/10/95	Bowser & Morner	4 1/4" HSA	8-inch	2"-PVC	31.00'

LOGGER	TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED
J. Ahmed			26.12'/' 3/21/95

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
					1, 2					**TOPSOIL**: organics; little coarse grained gravel; slightly moist; no odor.	
1	SS	14	4 9 13 5		3, 4					**CLAY**: stiff; and medium to coarse grained shale and siltstone fragments; and fine to medium grained sand; no odor; rust staining evident on siltstone fragments (**MINE SPOILS**).	SP=0, BZ=0
2	SS	15	8 6 6 7		5, 6					As above; weathered shale fragments with increase in clay content; little coal fragments; slightly moist; no odor.	SP=0
3	SS	10	19 12 6 6		7, 8, 9					**MINE SPOILS**: weathered siltstone fragments; and fine grained sand sub-angular; loose; little weathered shale fragments; trace clay; slightly moist; gray green; no odor.	SP=0, BZ=0
4	SS	10	7 7 7 8		10, 11					As above; increase in weathered shale content; and intermixed clay fragments.	SP=0
5	SS	10	7 7 8 11		12, 13, 14					As above; no coal; trace clay; little fine grained sand.	SP=0, BZ=0
6	SS	10	12 12 9 11		15, 16					**MINE SPOILS**: weathered sandstone; angular crumbling gravel; gray-green; slightly moist; grading to brown.	SP=0
7	SS	10	12 6 12 7		17, 18, 19					As above.	SP=0
8	SS	10	9 11 11 9		20, 21, 22					**SHALE**: weathered shale intermixed with coal fragments; dry; crumbling; little loose fine to medium grained sand; little clayey.	SP=0, BZ=0
9	SS	14	11							As above; wet at 23.8-feet	

*ASTM D1586 ST = SHELBY TUBE
SS = SPLIT SPOON C = CORE CS = CONTINUOUS SAMPLER
D = DENNISON CT = CUTTINGS BA = BUCKET AUG.

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION: American Steel Foundries, Alliance, Ohio

 HOLE NO. MW-13B

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
			12 7 13		24						SP=0
10	SS	11	9 13 14 10		25 26 27					As above; grading to stiff	SP=0, BZ=0
11	SS	10	11 13 17 12		28 29					As above; brown.	
12	CT				30 31					End of boring at 31.0-feet.	

*ASTM D1586 ST = SHELBY TUBE
SS = SPLIT SPOON C = CORE CS = CONTINUOUS SAMPLER
D = DENNISON CT = CUTTINGS BA = BUCKET AUG.

American Steel Foundries
Alliance, Ohio

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION	PAGE NO.	HOLE NO.
American Steel Foundries, Alliance, Ohio	1 of 2	MW-24

START	FINISH	DRILLER	DRILL METHOD	BOREHOLE DIAMETER	WELL DIAMETER	TOTAL DEPTH
3/9/95	3/10/95	Bowser & Morner	4 1/4" HSA	8-inch	2"-PVC	43.00'

LOGGER	TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED
J. Ahmed			30.37'/' 3/21/95

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
	CT				1					**FILL**: low plasticity clayey silt mixed with foundry sand; moist; no odor.	
1	SS	10	8 8 9 10		3					**CLAY**: stiff; and highly weathered shale and siltstone medium to coarse gravel; siltstone gravel highly angular with red staining evident; gray mottled green; moist; no odor.(**MINE SPOILS**)	SP=0, BZ=0
2	SS	10	5 7 16 14		5					As above; black fissile shale fragments; slightly moist.	SP=0
3	SS	6	10 18 22 30		8					**MINE SPOILS**: highly weathered siltstone intermixed with clay; trace sand; moist to wet; no odor.	SP=0, BZ=0
4	SS	13	12 48 14 16		10					As above; trace sandstone fragments; rusty appearance; brown; little shale fragments; black.	SP=0
5	SS	13	49 18 19 20		13					As above	SP=0, BZ=0
6	SS	4	24 25 28 27		15					grading to hard; with little clay and shale; slightly moist; gray-green; no odor.	SP=0
7	SS	10	13 11 12 14		18					As above; angular gray-green shale and siltstone fragments; slightly moist; trace clay.	SP=0
8	SS	10	12 13 19 13		20					As above; little sandstone angular fragments; trace coal pieces.	SP=0, BZ=0
9	SS	14	9		22					**MINE SPOILS**: highly weathered sandstone; intermixed	

*ASTM D1586
SS = SPLIT SPOON ST = SHELBY TUBE
D = DENNISON C = CORE CS = CONTINUOUS SAMPLER
CT = CUTTINGS BA =BUCKET AUG.

American Steel Foundries
Alliance, Ohio

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION: American Steel Foundries, Alliance, Ohio

 HOLE NO. MW-24

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
			10 13 11		24					with coal pieces; dry; friable; gray-green; slightly moist; no odor.	SP=0
10	SS	4	13 12 10 9		25 26 27					**MINE SPOILS**: stiff **silty clay**; and medium grained sand; fine to medium gravel consisting of shale; siltstone and sandstone fragments; grayish green; slightly moist; no odor.	SP=0, BZ=0
6	SS	6	12 22 18 12		28 29					**MINE SPOILS**: At approximately 29-feet grades to dark gray; **weathered shale**; platey; moderately hard; slightly moist. Stopped split spoon and drilled to 43-feet. Encountered water in Shale at approximately 38-feet bgs.	SP=0
	SS				30 31 32 33 34 35 36 37 38 39 40 41 42 43						SP=0, BZ=0 SP=0, BZ=0 SP=0, BZ=0 SP=0, BZ=0
										End of boring at 43.0-feet.	

*ASTM D1586 ST = SHELBY TUBE
SS = SPLIT SPOON C = CORE CS = CONTINUOUS SAMPLER
D = DENNISON CT = CUTTINGS BA = BUCKET AUG.

American Steel Foundries
Alliance, Ohio

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION	PAGE NO.	HOLE NO.
American Steel Foundries, Alliance, Ohio	1 of 2	MW-25

START	FINISH	DRILLER	DRILL METHOD	BOREHOLE DIAMETER	WELL DIAMETER	TOTAL DEPTH
3/7/95	3/7/95	Bowser & Morner	4 1/4" HSA	8-inch	2"-PVC	30.00'

LOGGER	TOP of CASING ELEV.	GROUND ELEVATION	DEPTH/ELEVATION GROUNDWATER - DATE MEASURED
J. Ahmed			18.00'/' 3/21/95

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
1	SS	14	33 13 7 6		1					**SAND AND GRAVEL**: medium dense; medium to coarse grained sand; medium to coarse gravel; trace metal and glass fragments; rusty sand; trace limestone gravel; brown; dry; no odor.	
2	SS	11	22 6 5 5		2, 3					**SAND**: medium dense; fine to medium grained foundry sand; and rootlets; black; slightly moist; no odor.	SP=0, BZ=0
3	SS	14	11 8 6 5		4, 5					As above	SP=0
4	SS	14	8 6 7 6		6, 7					**CLAY**: stiff; and coarse shale and siltstone angular gravel; moderately plastic; slightly moist; brown; gray shale and siltstone gravel; no odor.(MINE SPOILS).	
5	SS	15	5 5 6 7		8, 9					As above; increase in coarse shale and siltstone fragments	SP=0, BZ=0
6	SS	11	8 8 4 3		10, 11					As above; 3-inch fine to medium grained tan sand layer; slightly moist; loose; no odor.	SP=0
7	SS	12	3 5 3 4		12, 13					**MINE SPOILS**: At approximately 13.8-feet grades to grayish green highly weathered shale; soft; friable; easily separated by bedding planes; and weathered siltstone fragments; gray; slightly moist; no odor.	SP=0, BZ=0
8	SS	10	5 5 6 6		14, 15						SP=0
9	SS	14	4 5 4 4		16, 17					**CLAY**: stiff; some medium to coarse grained subangular to angular shale and siltstone gravel; green with gray mottling; soft at places; no odor (MINE SPOILS).	
10	SS	11	5 5 4 4		18, 19					As above	SP=0
11	SS	14	4 4 5 4		20, 21					As above; fractures; wet at the bottom of the spoon;	SP=0, BZ=0
12	SS	11	5 6		22					As above; greenish gray with brown mottling; dark brown mottling at places; and fine to coarse grained gravel;	

*ASTM D1586 ST = SHELBY TUBE
SS = SPLIT SPOON C = CORE CS = CONTINUOUS SAMPLER
D = DENNISON CT = CUTTINGS BA = BUCKET AUG.

GEOLOGIC DRILL LOG

PROJECT NAME AND LOCATION: American Steel Foundries, Alliance, Ohio

PAGE NO. 2 of 2 | HOLE NO. MW-25

SAMPLE NO.	SAMPLE TYPE	RECOVERY "	SAMPLE BLOWS*	ELEV	DEPTH	GRAPHIC LOG	WELL CONSTRUCTION	CLASS-IFICATION	SAMPLE INTERVAL	DESCRIPTION	Hnu readings (in units) BZ: Breathing Zone BH: Borehole SP: Sample HS: Headspace
			7 5							wet.	SP=0
13	SS	14	5 6 9 13		24 25					**SHALE**: highly weathered clay-like; gray; at approximately 25.4-feet is brown sandstone for approximately 2-inches; moist; no odor.	SP=0, BZ=0
14	SS	10	5 7 9 10		26 27					As above; grayish green; medium soft; weathered shale.	
15	SS	6	7 8 8 9		28 29 30					End of boring at 30-feet.	

*ASTM D1586
SS = SPLIT SPOON
D = DENNISON
ST = SHELBY TUBE
C = CORE
CT = CUTTINGS
CS = CONTINUOUS SAMPLER
BA = BUCKET AUG.

American Steel Foundries
Alliance, Ohio

PAGE NO. 2 of 2 | HOLE NO. MW-25

RMT INC

WELL DIAGRAM

(F-17:TFR:11/4/87)

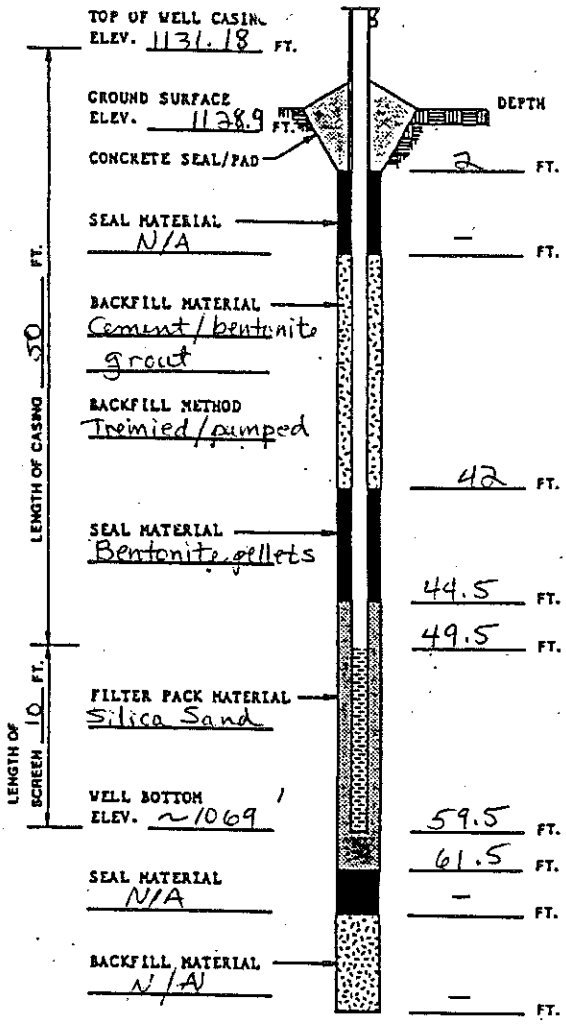
PROJECT NAME: ASF JOB NO.: 2169.02

LOCATION: Sebring Facility WELL NO.: MW-14

DATE INSTALLED: 8-14-91

PREPARED BY: R. Welch

MONITORING WELL CONSTRUCTION



BOREHOLE DIAMETER 10 IN. - 0 to 20 ft
6 IN. - 20 to 61.5 ft.

DRILLING METHOD HSA to 20', Air rotary to 61.5'

DRILLING CONTRACTOR R+R International
E. Pucci

1) WELL MATERIALS

A) TYPE OF PIPE:

(PVC) STAINLESS, TEFLON, OTHER ____

PIPE SCHEDULE 40

PIPE DIAMETER ID 2 IN., OD ____ IN.

B) TYPE OF PIPE JOINTS:

SLIP, (THREADED) (W/TAPE?), OTHER ____

SOLVENT CEMENT: YES or (NO)

C) TYPE OF WELL SCREEN:

(PVC) STAINLESS, TEFLON, OTHER ____

SLOT SIZE: 0.010 IN.

SCREEN DIAMETER: ID 2 IN., OD ____ IN.

D) INSTALLED PROTECTOR PIPE W/LOCK: (YES) or NO.

PROTECTOR PIPE DIA. 4 IN. LOCK NO. ____

2) WELL DEVELOPMENT

A) METHODS

(BAILING), PUMPING, (SURGING), COMPRESSED AIR

OTHER ____

B) APPROXIMATE WATER VOLUME:

REMOVED 5 gal. ADDED ____

DURATION OR VOLUME PUMPED:
30 min.

C) WATER CLARITY:

BEFORE DEVELOPMENT
CLEAR/(TURBID)/OPAQUE

AFTER DEVELOPMENT
CLEAR/(TURBID)/OPAQUE

D) ODOR: YES or (NO)

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?
____ FT. OR (DRY)

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/14/91 7:00 DEPTH 49.8 FT.

DATE/TIME ____ DEPTH ____ FT.

DATE/TIME ____ DEPTH ____ FT.

4) ADDITIONAL COMMENTS:

Location: N 10540.3
E 10453.4

PROLP 20.99

LOG OF TEST BORING

F-203 (R 01-87)

PROJECT NAME ASF-Chromite Sand Borings
LOCATION Sebring Landfill
CONTRACTOR R&R International
DRILLING METHOD HSA 6 1/4, A. Rotary

BORING NO. MW-14
SHEET NO. 1 OF 2
PROJECT NO. 2169.02
INSTALLATION 08/13/91
SURFACE ELEV. 1129.0
BOREHOLE DIA. 10, 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
					5	SANDSTONE BEDROCK, brown yellow 10YR 6/6, fine to medium.
					10	
	GRAB					As above, yellow-brown 10YR 5/4, rounded gravel size fragments.
					15	
					20	Switch to air rotary at 20'.
	GRAB					
					25	SANDSTONE, SHALE, and SILTSTONE in cuttings, light brown-gray 10YR 6/2, more angular "platy" fragments.
					30	
					35	

GENERAL NOTES

DATE STARTED AUG 13 91
DATE COMPLETED AUG 13 91
RIG CME 75
CREW CHIEF E. Pucci
LOGGED R. Welch CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 52.0 Ft.
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME DEPTH

LOG OF TEST BORING

F-203 (R 01-87)

PROJECT NAME ASF-Chromite Sand Borings
LOCATION Sebring Landfill
CONTRACTOR R&R International
DRILLING METHOD HSA 6 1/4, A. Rotary

BORING NO. MW-14
SHEET NO. 2 OF 2
PROJECT NO. 2169.02
INSTALLATION 08/13/91
SURFACE ELEV. 1129.0
BOREHOLE DIA. 10, 6 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL NO.	TYPE	RECOVERY N	RECOVERY IN	MOISTURE	DEPTH	
	GRAB				45	SHALE, very dark gray, "platy" fragments.
	GRAB				50	Gradational color change; dark to light gray.
					55	
					60	
					65	End of Boring at 61.5 Ft. in Shale.
					70	
					75	
					80	
					85	

RMT INC

WELL DIAGRAM

(F-17:TFR:11/4/87)

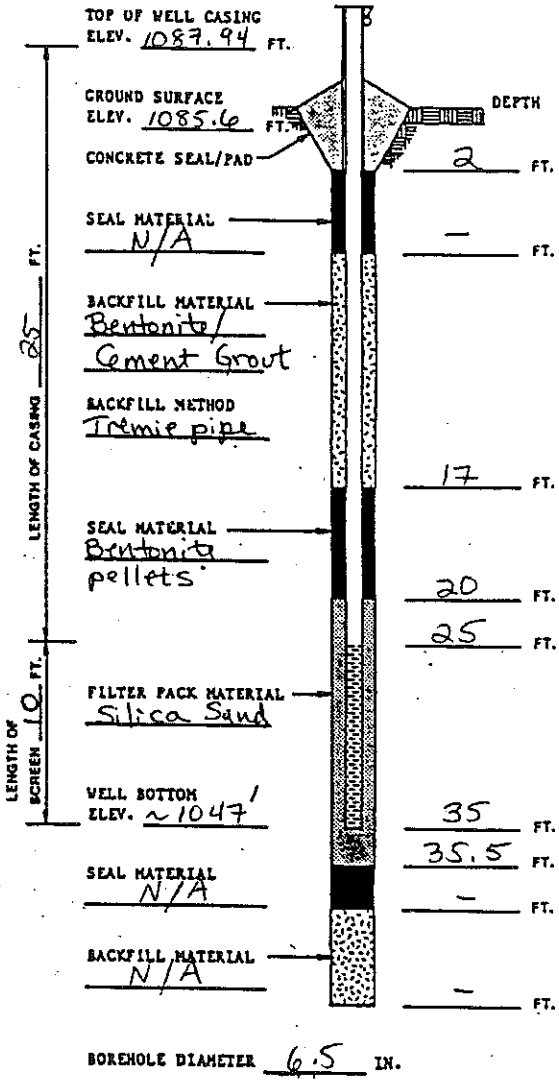
PROJECT NAME: ASF JOB NO.: 2169.02

LOCATION: Sebring Facility WELL NO.: MW-12

DATE INSTALLED: 8-8-91

PREPARED BY: R. Welch

MONITORING WELL CONSTRUCTION



BOREHOLE DIAMETER 6.5 IN.

DRILLING METHOD HSA 4.25" ID

DRILLING CONTRACTOR R+R International
E. Pucci

1) WELL MATERIALS

A) TYPE OF PIPE:

(PVC), STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

PIPE DIAMETER ID 2 IN., OD ____ IN.

B) TYPE OF PIPE JOINTS:

SLIP, (THREADED) (W/TAPE?), OTHER _____

SOLVENT CEMENT: YES or NO

C) TYPE OF WELL SCREEN:

(PVC), STAINLESS, TEFLON, OTHER _____

SLOT SIZE: 0.010 IN.

SCREEN DIAMETER: ID 2 IN., OD ____ IN.

D) INSTALLED PROTECTOR PIPE W/LOCK: (YES) or NO.

PROTECTOR PIPE DIA. 4 IN. LOCK NO. ____

2) WELL DEVELOPMENT

A) METHODS

(BAILING), PUMPING, (SURGING), COMPRESSED AIR

OTHER _____

B) APPROXIMATE WATER VOLUME:

REMOVED 5 gal. ADDED _____

DURATION OR VOLUME PUMPED:
40 minutes

C) WATER CLARITY:

BEFORE DEVELOPMENT
CLEAR/(TURBID)/OPAQUE

AFTER DEVELOPMENT
CLEAR/(TURBID)/OPAQUE

D) ODOR: YES or (NO)

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?
11.9 FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/13/91 17:20 DEPTH 11.5 FT.

DATE/TIME _____ DEPTH ____ FT.

DATE/TIME _____ DEPTH ____ FT.

4) ADDITIONAL COMMENTS: Location: N 10036.9
E 10245.3

PROJ# 28.99

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-12
SHEET NO. 1 OF 1
PROJECT NO. 2169.02
INSTALLATION 08/08/91
SURFACE ELEV. 1086.0
BOREHOLE DIA. 6.5 IN.

PROJECT NAME ASF-Chromite Sand Borings
LOCATION Sebring Landfill
CONTRACTOR R&R International
DRILLING METHOD HSA 4 1/4

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
1	SS	15	18	M		TOPSOIL first 5" then POORLY GRADED SAND.
2	SS	9	12	M	5	LEAN CLAY WITH SAND (CL\L), gray 10YR 6/1, medium stiff to stiff, slightly plastic, with rock fragments and wood, iron staining (Spoils).
3	SS	7	12	M	10	Same.
4	SS	8	16	M	15	
5	SS	9	14	M	20	Same.
6	SS	8	13	M	25	Same.
7	SS	11	16	M	30	POORLY GRADED SAND WITH SILT (SW-SM), very loose.
					35	End of Boring at 35.5 Ft. in Sand.

GENERAL NOTES

DATE STARTED AUG 8 91
DATE COMPLETED AUG 8 91
RIG CME 75
CREW CHIEF E. Pucci
LOGGED R. Welch CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 27.5 Ft.
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME DEPTH

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-1A
SHEET NO. 1 OF 1
PROJECT NO. 2169.02
INSTALLATION 08/06/91
SURFACE ELEV. 1124.0
BOREHOLE DIA. 12/6 IN.

PROJECT NAME ASF-Chromite Sand Borings
LOCATION Sebring Landfill
CONTRACTOR R&R International
DRILLING METHOD HSA 6 1/4, A.Rotary

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
1	SS	19	18	D		LEAN CLAY (CL), pale yellow 5Y 7/4, very stiff, plastic.
2	SS	64	18	D	5	Same with sand.
3	SS	50/5"	6	D	10	SILTSTONE, weathered in splitspoon sample, prominent planar fractures, iron staining along bedding planes. Cuttings at 11 feet, light brown gray 10YR 6/2, at 12.5 feet, light gray 10YR 6/1, micaceous, distinctly bedded. Switch to air rotary at 15 feet. Siltstone, shale, and sandstone in cuttings.
					15	
					20	
					25	Same.
					30	
					35	Same.
					40	
						End of Boring at 41.8 Ft. in Siltstone.

GENERAL NOTES

DATE STARTED AUG 5 91
DATE COMPLETED AUG 6 91
RIG CME 75
CREW CHIEF E. Pucci
LOGGED R. Welch CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 31.7 Ft.
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME DEPTH

RMT INC

WELL DIAGRAM

(F-17:TFR:11/4/87)

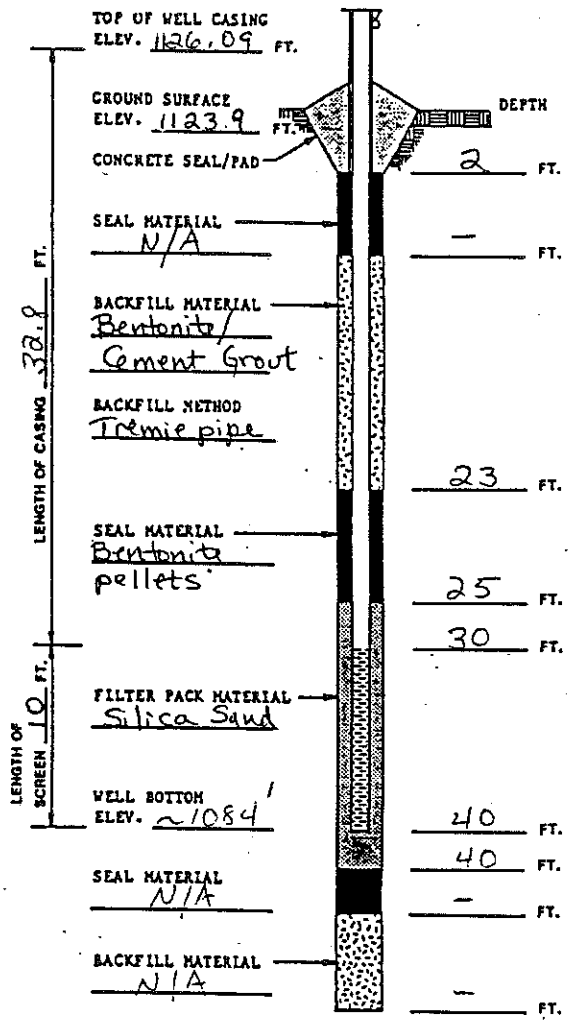
PROJECT NAME: ASF JOB NO.: 2169.02

LOCATION: Sebring Facility WELL NO.: MW-1A

DATE INSTALLED: 8-6-91

PREPARED BY: R. Welch

MONITORING WELL CONSTRUCTION



BOREHOLE DIAMETER 10 IN. to 15 ft. 6 in to 40 ft.

DRILLING METHOD _____

DRILLING CONTRACTOR R+R International E. Pacci

1) WELL MATERIALS

A) TYPE OF PIPE:

(PVC), STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

PIPE DIAMETER ID 2 IN., OD ____ IN.

B) TYPE OF PIPE JOINTS:

SLIP, (THREADED) (W/TAPE?), OTHER _____

SOLVENT CEMENT: YES or NO

C) TYPE OF WELL SCREEN:

(PVC), STAINLESS, TEFLON, OTHER _____

SLOT SIZE: 0.010 IN.

SCREEN DIAMETER: ID 2 IN., OD ____ IN.

D) INSTALLED PROTECTOR PIPE W/LOCK: (YES) or NO.

PROTECTOR PIPE DIA. 4 IN. LOCK NO. ____

2) WELL DEVELOPMENT

A) METHODS

(BAILING), PUMPING, (SURGING), COMPRESSED AIR

OTHER _____

B) APPROXIMATE WATER VOLUME:

REMOVED 3 gal. ADDED _____

DURATION OR VOLUME PUMPED: 15 min.

C) WATER CLARITY:

BEFORE DEVELOPMENT CLEAR/(TURBID)/OPAQUE

AFTER DEVELOPMENT CLEAR/(TURBID)/OPAQUE

D) ODOR: YES or (NO)

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT? _____ FT. OR (DRY)

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME 8/13/91 18:20 DEPTH 34.6 FT.

DATE/TIME _____ DEPTH ____ FT.

DATE/TIME _____ DEPTH ____ FT.

4) ADDITIONAL COMMENTS: Location: N 11137.4 E 10629.8
Void encountered at 30 ft. depth.
Nine (80 lb) bags of sand used to fill from 30.2 to 30.4 feet.
Three (50 lb) bags of sand used to fill from 30.4 to 25 feet.

PROJ.# 20.99

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-19
SHEET NO. 1 OF 1
PROJECT NO. 2169.17
INSTALLATION
SURFACE ELEV.
BOREHOLE DIA. IN.

PROJECT NAME ASF Sebring MW Installation
LOCATION Alliance, Ohio
CONTRACTOR Summit Drilling
DRILLING METHOD 6 1/4" HSA, Tricone

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
					5	No samples taken See boring log MW-19P for description of lithology
					10	
					15	
					20	
					25	
					30	
					35	
					40	
					45	

GENERAL NOTES

DATE STARTED NOV 23 93
DATE COMPLETED NOV 23 93
RIG CME 75
CREW CHIEF B. Krakow
LOGGED R. Welch CHECKED

WATER LEVEL OBSERVATIONS

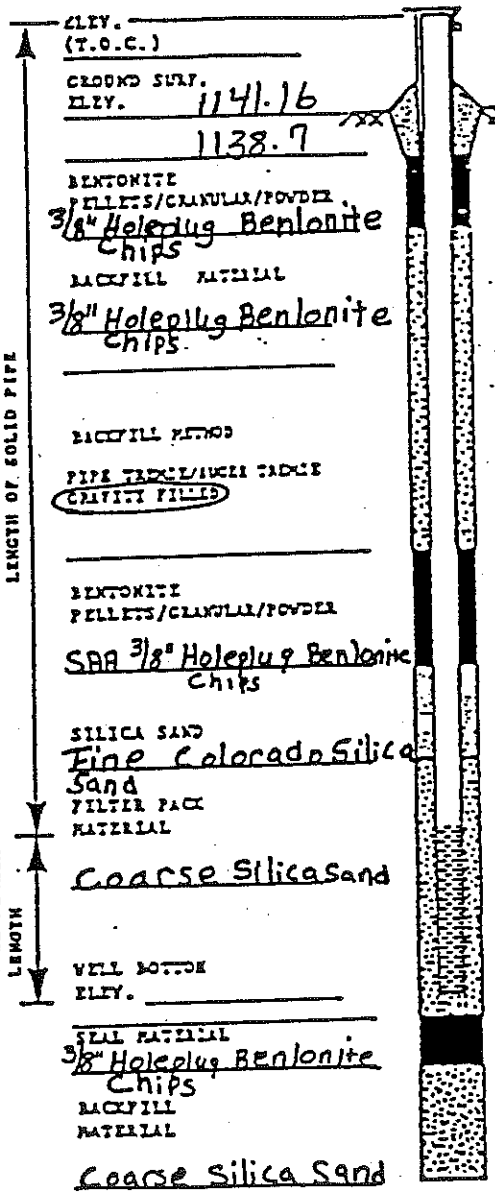
WHILE DRILLING ▽
AT COMPLETION ▽
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME DEPTH

American Steel Foundries

PROJECT NAME: Sebring Facility NO. 2169.17

WELL NO. MW-19

DATE INSTALLED 11-22-93



1) CASING DETAILS

A) TYPE OF PIPE:

(PVC) STAINLESS, TEFLON, OTHER

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS:

COUPLINGS, (THREADED) (W/TAPE?), OTHER

C) WAS SOLVENT USED? YES OR (NO)

D) TYPE OF WELL SCREEN:

(PVC) STAINLESS, TEFLON, OTHER

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.3

G) INSTALLED PROTECTOR PIPE W/LOCK? (YES) OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD

(BAILING) PUMPING, (SURGING) COMPRESSED AIR

OTHER

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 20 min.

C) APPROXIMATE WATER VOLUME: REMOVED 2 gal.

ADDED

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, (TURBID), OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, (SLIGHTLY TURBID), TURBID, OPAQUE

F) ODOR? YES OR (NO)

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

FT. OR (DRY)

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME Static 27 FT.

DATE/TIME FT.

DATE/TIME FT.

ADDITIONAL COMMENTS:

LOG OF TEST BORING

F-203 (R 01-87)

PROJECT NAME	ASF Sebring MW Installation	BORING NO.	MW-20
LOCATION	Alliance, Ohio	SHEET NO.	1 OF 1
CONTRACTOR	Summit Drilling	PROJECT NO.	2169.17
DRILLING METHOD	4 1/4" ID HSA	INSTALLATION	
		SURFACE ELEV.	
		BOREHOLE DIA.	10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
1	SS	7/8/8	12	MW20		LEAN CLAY (CL), black, 7.5YR, moist (qu=2.5), very stiff, slightly plastic, spoils
2	SS	10/12/12	12			
3	SS	7/9/10	14		5	LEAN CLAY (CL), 50% silt, reddish yellow and gray, 7.5YR 6/6, and 10YR 6/1, dry-moist (qu>4.5), hard, slightly plastic, spoils
4	SS	5/5/10	10			
5	SS	3/6/7	12			
6	SS	4/6/3	10		10	S.A.A., but noncohesive and dry
7	SS	5/3/4	12			SHALE, very friable, light brownish gray, 10YR 6/2, dry, powdered, spoils
8	SS	15/13/14	12			
9	SS	10/15/19	14		15	
10	SS	10/15/19	13			
11	SS	15/13/13	12			
12	SS	12/20/26	13			
13	SS	13/16/21	12		20	
14	SS	12/17/16	10			
15	SS	17/10/10	11			
					25	
					30	SHALE, more competent, light gray, 7.5YR N7/, dry
					▽	S.A.A., wet
					35	S.A.A.
					40	End of boring 39.5 feet

GENERAL NOTES

DATE STARTED NOV 8 93

DATE COMPLETED NOV 8 93

RIG CME 75

CREW CHIEF E. Pucci

LOGGED R. Welch CHECKED REH

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽ 32.0

AT COMPLETION ▼

AFTER DRILLING

CAVE-IN: DATE/TIME _____ DEPTH _____

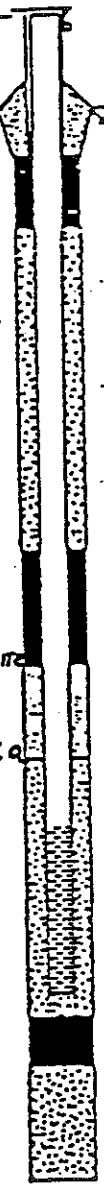
WATER: DATE/TIME _____ DEPTH _____

American Steel Foundries

PROJECT NAME: Sebring Facility NO. 2169.17

WELL NO. MW-20

DATE INSTALLED 11-8-93



ELEV. (T.O.C.) 1113.21

GROUND SURF. ELEV. 1110.7

DEPTH FROM GROUND SURFACE 0 FT.

BENTONITE PELLETS/GRANULE/POWDER 3/8" Holeplug Benlonite Chips — NA FT.

BACKFILL MATERIAL 3/8" Holeplug Benlonite Chips

3 5 FT. — LENGTH OF SOLID PIPE

BACKFILL METHOD

PIPE TREMIE/INNER TREMIE GRAVITY FILL

BOREHOLE DIA. ___ IN. — NA FT.

BENTONITE PELLETS/GRANULAR/POWDER SAA 3/8" Holeplug Benlonite Chips — 24 FT.

SILICA SAND Fine Colorado Silica Sand — 27 FT.

FILTER PACK MATERIAL Coarse Silica Sand — 29 FT.

0 FT. — WELL SCREEN LENGTH

WELL BOTTOM ELEV. ___ — 29 FT. / 34 FT.

SEAL MATERIAL NA — ___ FT.

BACKFILL MATERIAL NA — ___ FT.

1) CASING DETAILS

A) TYPE OF PIPE:

(PVC) STAINLESS, TEFLON, OTHER ___

PIPE SCHEDULE 80

B) TYPE OF PIPE JOINTS:

COUPLINGS, (THREADED) (W/TAPE?), OTHER ___

C) WAS SOLVENT USED? YES OR (NO)

D) TYPE OF WELL SCREEN:

(PVC) STAINLESS, TEFLON, OTHER ___

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.3

G) INSTALLED PROTECTOR PIPE W/LOCK? (YES) OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD

(BAILING) PUMPING, (SURGING) COMPRESSED AIR

OTHER ___

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 3 hrs.

C) APPROXIMATE WATER VOLUME: REMOVED 70 gal.

ADDED ___

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR (TURBID) OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, (TURBID) OPAQUE

F) ODOR? YES OR (NO)

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

___ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME Static 33.1 FT.

DATE/TIME ___ FT.

DATE/TIME ___ FT.

ADDITIONAL COMMENTS: ___

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-21
SHEET NO. 1 OF 1
PROJECT NO. 2169.17
INSTALLATION
SURFACE ELEV.
BOREHOLE DIA. IN.

PROJECT NAME ASF Sebring MW Installation
LOCATION Alliance, Ohio
CONTRACTOR Summit Drilling
DRILLING METHOD 4 1/4" ID HSA

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
					5	No samples taken See boring log MW-21P for description of lithology
					10	
					15	
					20	
					25	
					30	
					35	

GENERAL NOTES

DATE STARTED NOV 24 93
DATE COMPLETED NOV 24 93
RIG CME 75
CREW CHIEF E. Pucci
LOGGED R. Welch CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME DEPTH

American Steel Foundries

PROJECT NAME: Sebring Facility NO. 2169.17

WELL NO. MW-21

DATE INSTALLED 11-24-93

ELEV. (T.O.C.) 1101.12

GROUND SURF. ELEV. 1098.6

BENTONITE PELLETS/GRANULAR/POWDER 3/8" Holeplug Benlonite Chips — DEPTH FROM GROUND SURFACE 0 FT.

BACKFILL MATERIAL 3/8" Holeplug Benlonite Chips — NA FT.

BACKFILL METHOD PIPE TREMIE/INNER TREMIE GRAVITY FILLED — BOREHOLE DIA. 10 IN.

5 FT. — LENGTH OF SOLID PIPE

BENTONITE PELLETS/GRANULAR/POWDER SAA — NA FT.

SILICA SAND Fine Colorado Silica Sand — 16 FT.

FILTER PACK MATERIAL Coarse Silica Sand — 18 FT.

0 FT. — WELL SCREEN LENGTH — 20 FT.

WELL BOTTOM ELEV. — 30 FT. / 31 FT.

SEAL MATERIAL NA — FT.

BACKFILL MATERIAL NA — FT.

1) CASING DETAILS

A) TYPE OF PIPE: (PVC) STAINLESS, TEFLON, OTHER ____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS: COUPLINGS, (THREADED) (W/TAPE?), OTHER ____

C) WAS SOLVENT USED? YES OR (NO)

D) TYPE OF WELL SCREEN: (PVC) STAINLESS, TEFLON, OTHER ____

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.3

G) INSTALLED PROTECTOR PIPE W/LOCK? (YES) OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD (BAILING) PUMPING, (SURGING) COMPRESSED AIR

OTHER ____

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT: 45 min.

C) APPROXIMATE WATER VOLUME: REMOVED 30 gal.

ADDED ____

D) WATER CLARITY BEFORE DEVELOPMENT: CLEAR, (SILTY) OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT: CLEAR, (SLIGHTLY SILTY) SILTY, OPAQUE

F) ODOR? YES OR (NO)

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT? ____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME Static 22.1 FT

DATE/TIME ____ FT

DATE/TIME ____ FT

ADDITIONAL COMMENTS: ____

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO. MW-21P
SHEET NO. 1 OF 2
PROJECT NO. 2169.17
INSTALLATION
SURFACE ELEV.
BOREHOLE DIA. 10 IN.

PROJECT NAME ASF Sebring MW Installation
LOCATION Alliance, Ohio
CONTRACTOR Summit Drilling
DRILLING METHOD 4 1/4" ID HSA, Core

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
1	SS	4/6/7	4	MW21P		LEAN CLAY (CL), grayish brown, 10YR 5/2 (qu=3.5), very stiff, plastic, mottling throughout, spoils
2	SS	8/6/4	4			
3	SS	3/5/3	6			
4	SS	3/6/6/7	8		5	
5	SS	7/7/5/6	2	MW21		S.A.A., but dark gray, 10YR 4/1
6	SS	3/4/5/8	12			
7	SS	7/8/7/10	10		10	
8	SS	3/5/8/7	11			
9	SS	7/7/7/8	10			
10	SS	7/8/7/12	12			
11	SS	6/8/8/8	16		15	S.A.A., but gray, 5Y 3/1, shale fragments
12	SS	4/4/6/7	8			LEAN CLAY (CL), as above, brown, 10YR 5/3
13	SS	10/7/8/7	12			
14	SS	6/7/22/11	10		20	
15	SS	4/6/7/8	10			
16	SS	3/6/7/7	10			
17	SS	6/7/8/3	12		25	
						S.A.A.
					30	S.A.A., but wet

GENERAL NOTES

DATE STARTED NOV 23 93
DATE COMPLETED NOV 23 93
RIG CME 75
CREW CHIEF E. Pucci
LOGGED R. Welch CHECKED REH

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽
AT COMPLETION ▼
AFTER DRILLING
CAVE-IN: DATE/TIME DEPTH
WATER: DATE/TIME DEPTH

LOG OF TEST BORING

F-203 (R 01-87)

PROJECT NAME	ASF Sebring MW Installation	BORING NO.	MW-21P
LOCATION	Alliance, Ohio	SHEET NO.	2 OF 2
CONTRACTOR	Summit Drilling	PROJECT NO.	2169.17
DRILLING METHOD	4 1/4" ID HSA, Core	INSTALLATION	
		SURFACE ELEV.	
		BOREHOLE DIA.	10 IN.

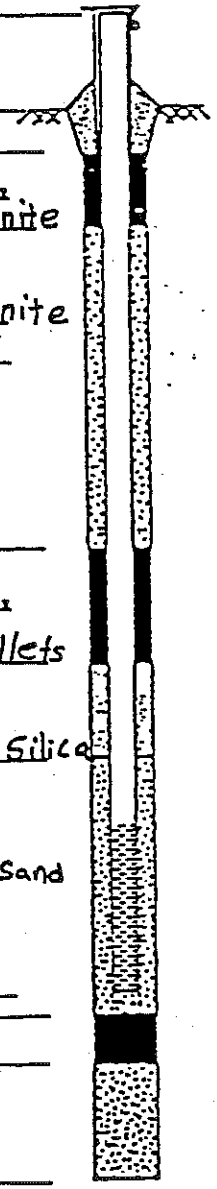
SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
				MW21P		Sandy seam at 37.5'-39.5'
					40	
						SHALE, gray, 7.5YR N6/, soft weathered, clay like
					45	
18	RC		100		50	SHALE, gray, 7.5YR N5/, hard, rqd=40%, distinct, light to dark gray laminous bedding
					55	
19	RC		100		60	S.A.A.
					65	End of boring 65 feet
					70	
					75	

American Steel Foundries

PROJECT NAME: Sebring Facility NO. 2169.17

WELL NO. MW-21P

DATE INSTALLED 11-24-93



ELEV. (T.O.C.) 1100.17

GROUND SURF. ELEV. 1097.7

DEPTH FROM GROUND SURFACE ____ FT.

BENTONITE PELLETS/GRANULAR/POWDER 3/8" Holeplug Benlonite Chips — 3 FT.

BACKFILL MATERIAL 3/8" Holeplug Benlonite Chips

6 5 FT.

BACKFILL METHOD PIPE TREMIE/AUGER TREMIE GRAVITY FILLED — BOREHOLE DIA. 10 IN. — 53 FT.

BENTONITE PELLETS/GRANULAR/POWDER 3/8" Benlonite Pellets — 56 FT.

SILICA SAND Fine Colorado Silica Sand — 60 FT.

FILTER PACK MATERIAL Coarse Silica Sand — 60 FT.

5 FT.

WELL BOTTOM ELEV. ____ — 65 FT. 65 FT.

SEAL MATERIAL NA — ____ FT.

BACKFILL MATERIAL NA — ____ FT.

LENGTH OF SOLID PIPE

WELL SCREEN LENGTH

1) CASING DETAILS

A) TYPE OF PIPE:

PVC STAINLESS, TEFLON, OTHER ____

PIPE SCHEDULE 80

B) TYPE OF PIPE JOINTS:

COUPLINGS, THREADED (W/TAPE?), OTHER ____

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC STAINLESS, TEFLON, OTHER ____

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.3

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD

BAILING PUMPING SURGING COMPRESSED AIR

OTHER ____

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 20 min.

C) APPROXIMATE WATER VOLUME: REMOVED 10 gal.

ADDED ____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME Static 22.1 FT.

DATE/TIME ____ FT.

DATE/TIME ____ FT.

ADDITIONAL COMMENTS: ____

LOG OF TEST BORING

F-203 (R 01-87)

BORING NO.	MW-22
SHEET NO.	1 OF 1
PROJECT NAME	ASF Sebring MW Installation
PROJECT NO.	2169.17
LOCATION	Alliance, Ohio
INSTALLATION	
CONTRACTOR	Summit Drilling
SURFACE ELEV.	
DRILLING METHOD	4 1/4" ID HSA
BOREHOLE DIA.	10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
					5	No samples taken See boring log MW-22P for description of lithology
					10	
					15	
					20	
					25	

GENERAL NOTES

DATE STARTED NOV 11 93

DATE COMPLETED NOV 11 93

RIG CME 75

CREW CHIEF B. Krakow

LOGGED R. Welch CHECKED

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽

AT COMPLETION ▼

AFTER DRILLING

CAVE-IN: DATE/TIME DEPTH

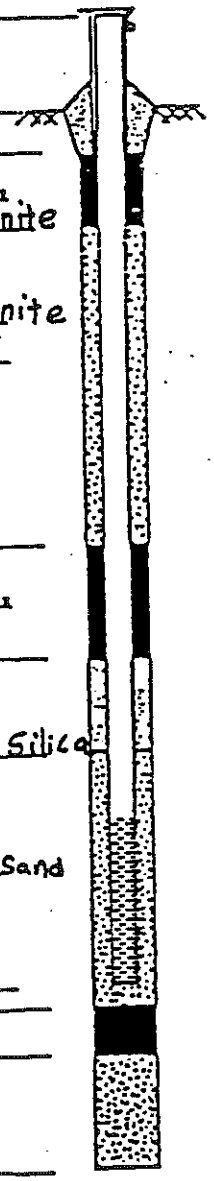
WATER: DATE/TIME DEPTH

American Steel Foundries

PROJECT NAME: Sebring Facility NO. 2169.17

WELL NO. MW-22

DATE INSTALLED 11-11-93



ELEV. (T.O.C.) 1091.01		
GROUND SURF. ELEV. 1088.5	DEPTH FROM GROUND SURFACE	0 FT.
BENTONITE PELLETS/GRANULAR/POWDER 3/8" Holeplug Benlonite Chips		NA FT.
BACKFILL MATERIAL 3/8" Holeplug Benlonite Chips		
BACKFILL METHOD PIPE TREMIE/AUGER TREMIE GRAVITY FILLED	BOREHOLE DIA.	10 IN.
		NA FT.
BENTONITE PELLETS/GRANULAR/POWDER SAA		6 FT.
SILICA SAND Fine Colorado Silica Sand		8 FT.
FILTER PACK MATERIAL Coarse Silica Sand		10 FT.
WELL BOTTOM ELEV.		20 FT. 20 FT.
SEAL MATERIAL NA		FT.
BACKFILL MATERIAL NA		FT.

LENGTH OF SOLID PIPE: 15 FT.

WELL SCREEN LENGTH: 0 FT.

1) CASING DETAILS

A) TYPE OF PIPE:

PVC STAINLESS, TEFLON, OTHER

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS:

COUPLINGS, THREADED (W/TAPE?), OTHER

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC STAINLESS, TEFLON, OTHER

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.3

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 35 min.

C) APPROXIMATE WATER VOLUME: REMOVED 5 gal.

ADDED

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME Static 13.4 FT.

DATE/TIME FT.

DATE/TIME FT.

ADDITIONAL COMMENTS:

LOG OF TEST BORING

F-203 (R 01-87)

PROJECT NAME	ASF Sebring MW Installation	BORING NO.	MW-22P
LOCATION	Alliance, Ohio	SHEET NO.	1 OF 2
CONTRACTOR	Summit Drilling	PROJECT NO.	2169.17
DRILLING METHOD	4 1/4" ID HSA, Core	INSTALLATION	
		SURFACE ELEV.	
		BOREHOLE DIA.	10 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
1	SS	6/7/4	12	M		POORLY GRADED SAND (SP), very dark gray, 10YR 3/1, moist, medium dense, foundry sand
2	SS	6/8/6	13	W		
3	SS	3/3/5	13	2	5	S.A.A.
4	SS	3/5/3	14	2		LEAN CLAY (CL), approximately 10% silt, gray, 10YR 5/1, moist (qu=2.0), stiff, slightly plastic, spoils
5	SS	3/4/6	10	M		
6	SS	8/3/4	11	W	10	S.A.A.
7	SS	3/5/5	13	2		SILT (ML), 5-10% medium coarse sand, dark gray, 7.5YR N4/, wet, medium dense, spoils/foundry sand
8	SS	3/10/9	12	2		
9	SS	4/8/15	12	P	15	S.A.A.
10	SS	4/8/7	14			
11	SS	9/10/15	15			S.A.A.
12	SS	7/12/18	12			
13	SS	4/12/13	15		20	LEAN CLAY (CL), 40% slt, slightly plastic, light brownish gray, 10YR 6/2, wet (qu=1), medium stiff to stiff, very angular rock (sandstone/siltstone) fragments' interspersed throughout, very inconsistent color
14	SS	5/10/16	14			
15	SS	10/18/18	15			SHALE, weathered, soft clay like, plastic, light gray, 10YR 6/1
16	SS	12/11/16	16		25	LEAN CLAY (CL), 30-40% silt, slightly plastic, dark grayish brown, 10YR 4/2, wet (qu=5), soft, very inconsistent color, siltstone fragments throughout
17	SS	9	10			
18	SS	11 50/3"	4			
19	SS	50/6" 50/3"	2		30	S.A.A.

GENERAL NOTES

DATE STARTED	NOV 9 93
DATE COMPLETED	NOV 9 93
RIG	CME 75
CREW CHIEF	E. Pucci
LOGGED	R. Welch
CHECKED	REH

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽	12.5
AT COMPLETION ▼	
AFTER DRILLING	
CAVE-IN: DATE/TIME	DEPTH
WATER: DATE/TIME	DEPTH

LOG OF TEST BORING

F-203 (R 01-87)

PROJECT NAME	ASF Sebring MW Installation	BORING NO.	MW-22P
LOCATION	Alliance, Ohio	SHEET NO.	2 OF 2
CONTRACTOR	Summit Drilling	PROJECT NO.	2169.17
DRILLING METHOD	4 1/4" ID HSA, Core	INSTALLATION	
		SURFACE ELEV.	
		BOREHOLE DIA.	10 IN.

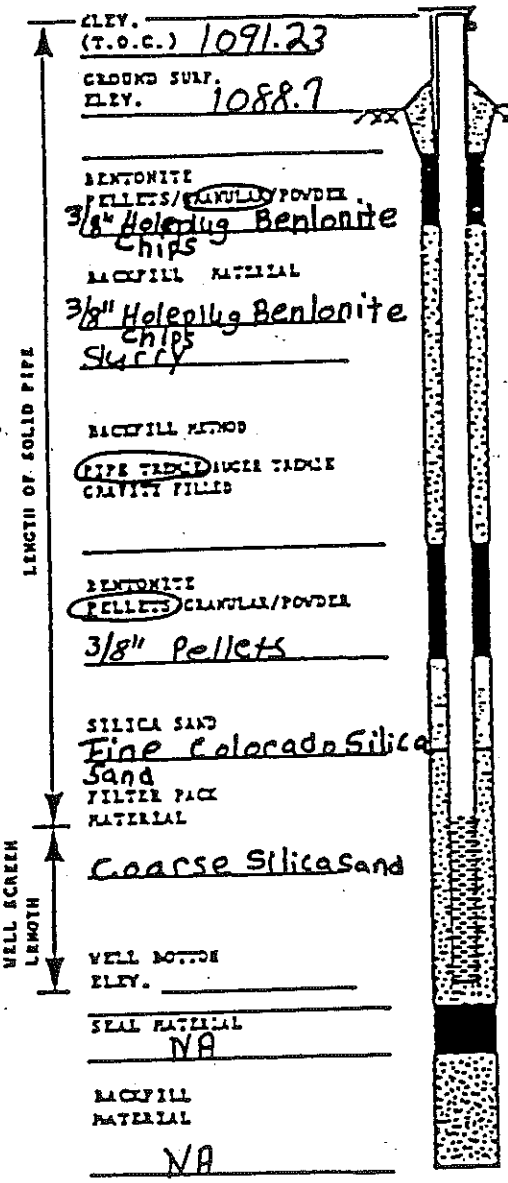
SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
				MW22P		S.A.A., but 2" sand layer at top
					40	
						SHALE, soft, weathered, clay like, gray, 7.5YR N6/
					45	
20	RC		60		50	Auger refused at 50' 50' change from HSA to rock coring SHALE, hard, gray, 7.5YR N5/, massive, distinct bedding laminating, rqd=0%
					55	
21	RC		95		60	S.A.A.
						64' vertical fractures
					65	End of boring 65 feet
					70	
					75	

American Steel Foundries

PROJECT NAME: Sebring Facility NO. 2169.17

WELL NO. MW-22P

DATE INSTALLED 11-10-93



1) CASING DETAILS

A) TYPE OF PIPE:

PVC STAINLESS, TEFLON, OTHER

PIPE SCHEDULE 80

B) TYPE OF PIPE JOINTS:

COUPLINGS, THREADED (W/TAPE?), OTHER

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC STAINLESS, TEFLON, OTHER

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.3

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 35 min.

C) APPROXIMATE WATER VOLUME: REMOVED 39 gal.

ADDED

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME Static 15.7 FT.

DATE/TIME FT.

DATE/TIME FT.

ADDITIONAL COMMENTS:

LOG OF TEST BORING

F-203 (R 01-87)

PROJECT NAME	ASF Sebring MW Installation	BORING NO.	MW-23
LOCATION	Alliance, Ohio	SHEET NO.	1 OF 1
CONTRACTOR	Summit Drilling	PROJECT NO.	2169.17
DRILLING METHOD	6 1/4" ID HSA	INSTALLATION	
		SURFACE ELEV.	
		BOREHOLE DIA.	12 IN.

SAMPLING NOTES						VISUAL CLASSIFICATION AND GENERAL OBSERVATIONS
INTERVAL		RECOVERY		MOISTURE		
NO.	TYPE	N	IN		DEPTH	
1	SS	3/7/9	6	M		LEAN CLAY (CL), reddish yellow, 7.5YR 6/6, dry (qu=4.5+), hard, slightly-moderately plastic, dark brown mottling, spoils
2	SS	6/7/7	7	W		
3	SS	7/4/9	7	2		
4	SS	6/6/7	9	3	5	
5	SS	9/8/8	8			
6	SS	8/9/8	10			
7	SS	6/9/9	12		10	
8	SS	10/8/8	14			
9	SS	9/7/8	14			
10	SS	6/7/9	12			
11	SS	7/7/10	16		15	LEAN CLAY (CL), 10YR 5/4, yellowish brown, moist (qu=4.0-4.5), hard, plastic, some strong brown mottling with shale fragments throughout
12	SS	12/10/9	12			
13	SS	11/11/11	8			
14	SS	13/11/12	10		20	
15	SS	12/4/8	12			
16	SS	7/9/12	12			
17	SS	10/7/7	14		25	
18	SS	7/9/11	12			
19	SS	8/6/10	14			
					30	
					35	
						End of boring 36.5 feet

GENERAL NOTES

DATE STARTED NOV 22 93

DATE COMPLETED NOV 23 93

RIG CME 75

CREW CHIEF B. Krakow

LOGGED R. Welch CHECKED REH

WATER LEVEL OBSERVATIONS

WHILE DRILLING ▽

AT COMPLETION ▼

AFTER DRILLING

CAVE-IN: DATE/TIME _____ DEPTH _____

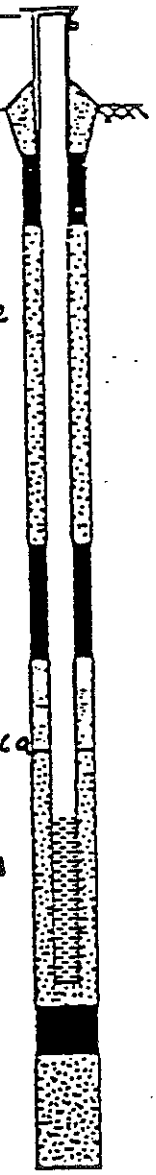
WATER: DATE/TIME _____ DEPTH _____

American Steel Foundries

PROJECT NAME: Sebring Facility NO. 2169.17

WELL NO. MW-23

DATE INSTALLED 11-23-93



ELEV. (T.O.C.) 1107.81		
GROUND SURF. ELEV. 1105.3	DEPTH FROM GROUND SURFACE	0 FT.
BENTONITE PELLETS/GRANULAR/POWDER 3/8" Holeplug Benlonite Chips		NA FT.
BACKFILL MATERIAL 3/8" Holeplug Benlonite Chips		
BACKFILL METHOD	BOREHOLE DIA.	10 IN.
PIPE TREMIE/AUGER TREMIE GRAVITY FILLED		NA FT.
BENTONITE PELLETS/GRANULAR/POWDER SAA		13 FT.
SILICA SAND Fine Colorado Silica Sand		14 FT.
FILTER PACK MATERIAL Coarse Silica Sand		16 FT.
WELL BOTTOM ELEV.		26 FT. 27 FT.
SEAL MATERIAL 3/8" Holeplug Chips		30 FT.
BACKFILL MATERIAL 3/8" Holeplug Chips		35 FT.

LENGTH OF SOLID PIPE: 25 FT.

WELL SCREEN LENGTH: 0 FT.

1) CASING DETAILS

A) TYPE OF PIPE:

PVC, STAINLESS, TEFLON, OTHER _____

PIPE SCHEDULE 40

B) TYPE OF PIPE JOINTS:

COUPLINGS, THREADED (W/TAPE?), OTHER _____

C) WAS SOLVENT USED? YES OR NO

D) TYPE OF WELL SCREEN:

PVC, STAINLESS, TEFLON, OTHER _____

E) WELL SCREEN SLOT SIZE 0.010

F) PIPE DIA: ID IN. 2.0 OD IN. 2.3

G) INSTALLED PROTECTOR PIPE W/LOCK? YES OR NO

PROTECTOR PIPE DIA. 4 IN.

2) WELL DEVELOPMENT

A) METHOD

BAILING, PUMPING, SURGING, COMPRESSED AIR

OTHER _____

(NOTE ADDITIONAL COMMENTS BELOW)

B) TIME SPENT FOR DEVELOPMENT? 35 min.

C) APPROXIMATE WATER VOLUME: REMOVED 18 gal.

ADDED _____

D) WATER CLARITY BEFORE DEVELOPMENT?

CLEAR, TURBID, OPAQUE

E) WATER CLARITY AFTER DEVELOPMENT?

CLEAR, SLIGHTLY TURBID, TURBID, OPAQUE

F) ODOR? YES OR NO

3) WATER LEVEL SUMMARY

A) DEPTH FROM TOP OF CASING AFTER DEVELOPMENT?

_____ FT. OR DRY

B) OTHER MEASUREMENTS (T.O.C.):

DATE/TIME Static 18.5 FT.

DATE/TIME _____ FT.

DATE/TIME _____ FT.

ADDITIONAL COMMENTS: _____

APPENDIX C

OUTLINE FOR THE ASSESSMENT MONITORING PROGRAM

SECTION 1
INTRODUCTION

This plan serves as an outline that describes the Groundwater Quality Assessment Plan (GWQAP) for the American Steel Foundries (ASF) Sebring, Ohio Landfill facility. The GWQAP is a contingent plan that will only be implemented in the event that a statistically significant difference between indicator parameter concentrations in downgradient groundwater and background groundwater concentrations established for upgradient wells. This outline has been prepared in accordance with Ohio Administrative Code 0AC 3745-65-93.

In accordance with OAC 3745-65-93(D)(3) and (4), once a statistically significant difference is confirmed, a GWQAP will be developed and submitted for approval. This plan will allow for the determination of the nature and extent of groundwater contamination.

Section 2 of this outline describes a potential Groundwater Assessment Program that may be implemented in the event of a statistically significant difference in downgradient groundwater quality. Section 3 of this outline presents a discussion concerning the evaluation of GWQAP investigation results and of requirements for reporting these results.

SECTION 2

GROUNDWATER ASSESSMENT PROGRAM

In accordance with OAC 3745-65-93(A), this outline has been developed to describe a GWQAP that may be implemented at the Sebring Landfill facility. This outline describes a more comprehensive groundwater monitoring program than that described in OAC 3745-65-91 and 3745-65-92. The GWQAP will be capable of determining:

- Whether hazardous waste of hazardous waste constituents have entered the groundwater.
- The rate and extent of migration of hazardous waste or hazardous waste constituents in the groundwater.
- The concentrations of hazardous waste or hazardous waste constituents in the groundwater.

In accordance with OAC 3745-65-93(B), indicator parameter analytical results from each downgradient well will be compared to the initial indicator parameter background level established for upgradient monitoring wells. These comparisons will consider individually each well within the monitoring system using an appropriate statistical method at the 0.01 level of significance.

In accordance with OAC 3745-65-93(C)(1), if a statistically significant increase, or pH decrease is confirmed, ASF will submit these results to the OEPA on an annual basis, in accordance with OAC 3745-65-94(A)(2)(b). In accordance with OAC 3745-65-93(C)(2), ASF will then immediately collect additional groundwater samples from those downgradient wells where a significate change in groundwater quality was observed. These samples will be split in two, and analyzed to determine if the significant difference was the result of laboratory error. In accordance with OAC 3745-65-93(D)(1), if the significant change is confirmed, ASF will provide written notice to OEPA within seven days of the date of confirmation that the facility may be affecting groundwater quality. In accordance with OAC 3745-65-93(D)(2), within fifteen days after the notification under paragraph (D)(1), ASF will develop and submit to the OEPA a specific plan for a GWQAP at the facility.

This plan may include completion of the tasks which are outlined in the following subsections.

2.1 GROUNDWATER MONITORING WELL INSTALLATION

The GWQAP may include the installation of additional groundwater monitoring wells at location that will assist ASF in determining the rate and extent of migration of hazardous waste or hazardous waste constituents. In accordance with OAC 3745-65-93(D)(3)(a), the plan to be submitted will specify the number, location, and anticipated depths of all additional groundwater monitoring wells to be installed.

Additional groundwater monitoring wells will be installed further downgradient than any existing downgradient monitoring well where a statistically significant change in groundwater quality has occurred. The depth of additional monitoring wells will be dependent upon the depth of the initial downgradient well. If analysis of a groundwater sample from a downgradient well screened within the mine spoils indicates a significant change in groundwater quality, then the additional downgradient monitoring well will be installed within the mine spoils (if present). Likewise, if the significant change is observed within a groundwater sample from a well screened within the bedrock, the additional downgradient well will be screened within the bedrock.

All additional groundwater monitoring wells installed as part of the GWQAP will be installed and developed in accordance with procedures described in the Groundwater Sampling and Analysis Plan (GWSAP).

2.2 GROUNDWATER SAMPLING

In accordance with OAC 3745-64-93(D)(3)(b), the plan submitted will specify the sampling parameters and analytical methods for groundwater sample analysis during the GWQAP. Groundwater samples will be collected following the procedures outlined within the GWSAP.

2.3 DECONTAMINATION PROCEDURES

Decontamination of the drill rig, drilling equipment, and all sampling equipment will be completed in accordance with the procedures outlined in the GWSAP.

2.4 SAMPLE HANDLING AND SHIPMENT

All samples collected as part of the GWQAP will be handled, packaged, and shipped in accordance with the procedures outlined in the GWSAP.

SECTION 3
EVALUATION AND REPORT

In accordance with OAC 3745-65-93(D)(5), ASF will implement the GWQAP as soon as technically feasible. ASF will evaluate the groundwater analytical data such that the nature and extent of contamination can be delineated. In addition, the velocity of groundwater and contaminant flow will be determined according to the methods described in the GWQAP plan. Within 15 days after completing the assessment, ASF will submit a written report to the OEPA, containing an assessment of the groundwater quality.

APPENDIX D

STATISTICAL PROCEDURES

CALCULATION OF CONFIDENCE LIMITS

A. This method should be used to predict the confidence limit when single groundwater samples are taken from each monitoring (test) well.

1. Determine the arithmetic mean of $(\bar{X}_b)$ each indicator parameter for the background sampling period. A recommended minimum of 20 background samples must be taken over a period of one year. If more than one background (upgradient) well is used, an equal number of samples must be taken from each well.

$$\bar{X}_b = \frac{X_1 + X_2 + \ldots + X_n}{n}$$

Where:

$\bar{X}_b$ = Average background value for a given chemical parameter

X_n = Background values for each upgradient sample

n = the number of background samples taken

2. Calculate the background variance (S_b^2) and standard deviation (S_b) for each parameter using the values (X_n) from each background sample of the ugpradient wells(s) as follows:

$$S_b^2 = \frac{(X_1 - \bar{X}_b)^2 + (X_2 - \bar{X}_b)^2 + \ldots + (X_n - \bar{X}_b)^2}{n - 1}$$

$$S_b = \sqrt{S_b^2}$$

3. Calculate the upper confidence limit using the following formula:

$$CL = \bar{X}_b \pm t\sqrt{1+1/n}\ (S_b)$$

Where:

CL = upper confidence limit prediction (upper and lower limits should be calculated for ph)

t = one-tailed t value at the required significance level and at n-1 degrees of freedom from Table 1 (a two-tailed t value should be used for pH)

4. If the values of any routine parameter for any monitoring well exceeds the upper confidence limit for that parameter, the permittee shall conclude that a statistically significant change has occurred at that well.

5. When some of the background (upgradient) values are less than the Method Detection Limit (MDL), a value of one-half (1/2) the MDL shall be substituted for each background value that is reported as less than the MDL. All other computations shall be calculated as given above.

B. If all the background (upgradient) values are less than the MDL for a given parameter shall be used to evaluate data from monitoring wells. If the analytical results from any monitoring well exceeds two (2) times the PQL for any single parameter, the permittee shall conclude that a statistically significant change has occurred.

Table 1

Standard T-Tables Level of Significance

Degrees of Freedom	t - values (one-tail)		t - values (Two-tail)*	
	99%	95%	99%	95%
4	3.747	2.132	4.604	2.776
5	3.365	2.015	4.032	2.571
6	3.143	1.943	3.707	2.447
7	2.998	1.895	3.499	2.365
8	2.896	1.860	3.355	2.306
9	2.821	1.833	3.250	2.262
10	2.764	1.812	3.169	2.228
11	2.718	1.796	3.106	2.201
12	2.681	1.782	3.055	2.179
13	2.650	1.771	3.012	2.160
14	2.624	1.761	2.977	2.145
15	2.602	1.753	2.947	2.131
16	2.583	1.746	2.921	2.120
17	2.567	1.740	2.898	2.110
18	2.552	1.734	2.878	2.101
19	2.539	1.729	2.861	2.093
20	2.528	1.725	2.845	2.086
21	2.518	1.721	2.831	2.080

Degrees of Freedom	t - values (one-tail)		t - values (Two-tail)*	
22	2.508	1.717	2.819	2.074
23	2.500	1.714	2.807	2.069
24	2.492	1.711	2.797	2.064
25	2.485	1.708	2.787	2.060
30	2.457	1.697	2.750	2.042
40	2.423	1.684	2.704	2.021

Adopted from Table III of *"Statistical Tables for Biological Agricultural and Medical Research"* (1947, R.A. Fisher and F. Yates).

* For pH only when required.

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APPROVED BY _____ DEPT _____ DATE _____

PH MW-23

Results

12/93	6.90 S.U.
3/94	6.00
6/94	6.40
9/94	6.30
3/95	6.80

① $\bar{X}_m = 6.48$

② $$S_b^2 = \frac{(6.9-6.48)^2 + (6-6.48)^2 + (6.4-6.48)^2 + (6.3-6.48)^2 + (6.8-6.48)^2}{4}$$

$$= \frac{0.18 + 0.23 + 0.0064 + 0.032 + 0.10}{4}$$

$$= 0.14$$

③ $S_b = \sqrt{0.14} = 0.37$

④ $$CL_{up} = 6.48 + 4.604\sqrt{1+\tfrac{1}{5}}\,(0.37)$$

$$= 8.35$$

$$CL_{Down} = 6.48 - 4.604\sqrt{1+\tfrac{1}{5}}\,(0.37) = 4.61$$

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Specific Conductance
MW-23

Results

12/93	2100	umhos/cm
3/94	1300	
6/94	1580	
9/94	1071	
3/95	1350	

① $\overline{X}^m = 1480.20$

② $Sb^2 = \frac{(2100-1480)^2 + (1300-1480)^2 + (1580-1480)^2 + (1071-1480)^2 + (1350-1480)^2}{4}$

$= \frac{3.84\times10^5 + 3.24\times10^4 + 1.0\times10^4 + 1.67\times10^5 + 1.69\times10^4}{4}$

$= 1.53\times10^5$

③ $Sb = \sqrt{1.53\times10^5} = 391$

④ $CL = 1480 + 3.477\sqrt{1+1/5}\,(391) = 2135$

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DETERMINATION OF UPPER TOLERANCE LIMIT and lower FOR BEDROCK WELLS MW-1A, MW14, MW-19 pH (SU)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	3.5	4
	03-15-94	3.2	5.29
	06-15-94	4.1	1.96
	09-14-94	4.3	1.44
MW-14	12-14-93	7.2	2.89
	03-15-94	6.2	0.49
	06-15-94	7.1	2.56
	09-14-94	6.8	1.69
MW-19	12-14-93	6.2	0.49
	03-15-94	5.4	0.01
	06-15-94	6.5	1
	09-14-94	5.5	0
* ARITHMATIC MEAN ($\bar{X}$):		5.5	21.82

SUMMARY OF STATISTICS

$\bar{X} = 5.5$

$S_b^2 = 1.98$

$S_b = 1.41$

$UTL_{99\%} = 10.1$

$LTL_{99\%} = 0.94$

BACKGROUND VARIANCE CONCENTRATION (S_b^2)

$$\frac{21.82}{11} = 1.98$$

STANDARD DEVIATION (S_b)

$$\sqrt{1.98} = 1.41$$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

$$5.5 + 3.106\sqrt{1+1/12}\,(1.41) = 10.1$$

$$5.5 - 3.106\sqrt{1+1/12}\,(1.41) = 0.94$$

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DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW-19
Specific Conductance umhos/cm

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	2200	4.2×10^5
	03-15-94	1920	1.34×10^5
	06-15-94	2050	2.50×10^5
	09-14-94	1950	1.57×10^5
MW-14	12-14-93	1100	2.06×10^5
	03-15-94	1430	1.53×10^4
	06-15-94	1640	7.44×10^3
	09-14-94	1750	3.85×10^4
MW-19	12-14-93	170	1.91×10^6
	03-15-94	1430	1.53×10^4
	06-15-94	1430	1.53×10^4
	09-14-94	1545	4.51×10^2
*	ARITHMATIC MEAN ($\bar{X}$):	1553.75	3.20×10^6

SUMMARY OF STATISTICS

$\bar{X} = 1553.75$

$S_b^2 = 2.88 \times 10^5$

$S_b = 536.77$

$UTL_{99\%} = 3,072$

BACKGROUND VARIANCE CONCENTRATION (S_b^2)

$$\frac{3.20 \times 10^6}{11} = 2.88 \times 10^5$$

STANDARD DEVIATION (S_b)

$$\sqrt{2.88 \times 10^5} = 536.77$$

UPPER TOLERANCE LIMIT @ 99% CONFIDENCE LEVEL (UTL)

$$1553.75 + 2.718\sqrt{1+1/12}\,(536.77) = 3072$$

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DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19
Total Phenolics (mg/L)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	0.005	1.296×10^{-3}
	03-15-94	0.034	4.9×10^{-5}
	06-15-94	0.005	1.296×10^{-3}
	09-14-94	0.005	1.296×10^{-3}
MW-14	12-14-93	0.005	1.296×10^{-3}
	03-15-94	0.26	4.796×10^{-2}
	06-15-94	0.12	6.241×10^{-3}
	09-14-94	0.02	4.41×10^{-4}
MW-19	12-14-93	0.01	9.61×10^{-4}
	03-15-94	0.005	1.296×10^{-3}
	06-15-94	0.01	9.61×10^{-4}
	09-14-94	0.04	9×10^{-4}
ARITHMATIC MEAN ($\bar{X}$):		0.041	0.063993

SUMMARY OF STATISTICS

$\bar{X} = 0.041$

$S_b^2 = 0.0058$

$S_b = 0.076$

$UTL_{99\%} = 0.26$

BACKGROUND VARIANCE CONCENTRATION (S_b^2) $\frac{0.063993}{11} = 0.0058$

STANDARD DEVIATION (S_b) $\sqrt{0.0058} = 0.076$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL) $0.041 + 2.718\sqrt{1+1/12}\,(0.076)$

$= 0.26$

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DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19
CADMIUM (µg/l)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* x	$(x-\bar{x})^2$
MW-1A	12-14-93	0.760	0.0079
	03-15-94	3.200	~~2.3508~~ 5.5264
	06-15-94	2.000	1.3244
	09-14-94	1.600	0.5638
MW-14	12-14-93	0.150 +	0.4888
	03-15-94	0.150 +	0.4888
	06-15-94	0.150 +	0.4888
	09-14-94	0.150 +	0.4888
MW-19	12-14-93	0.150 +	0.4888
	03-15-94	0.890	0.0016
	06-15-94	0.330	0.2695
	09-14-94	0.660	0.0357
ARITHMATIC MEAN ($\bar{x}$):		0.849	10.172

SUMMARY OF STATISTICS

$\bar{x}$ = 0.849

S_b^2 =

S_b =

$NTL_{99\%}$ = ~~3.674 µg/l~~ 3.571 µg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2) $\frac{10.172}{11}$ = 0.925

STANDARD DEVIATION (S_b) = $\sqrt{.925}$ = 0.962

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

~~$0.849 + 2.718\left(1 + \frac{0.962}{12}\right)^{1/2} = 0.849 + 2.825 = 3.674$ µg/l~~

$0.849 + 2.718(1.041)\,0.962 = 0.849 + 2.722 = 3.571$

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DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19

CHLORIDE (mg/l)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	97.000	98.506
	03-15-94	310.000	4969.556
	06-15-94	220.000	17669.056
	09-14-94	270.000	33461.556
MW-14	12-14-93	28.000	3489.856
	03-15-94	32.000	3033.256
	06-15-94	23.000	4105.606
	09-14-94	26.000	3730.156
MW-19	12-14-93	16.000	5051.656
	03-15-94	13.000	5487.106
	06-15-94	5.100	6719.901
	09-14-94	4.800	6769.176
* ARITHMATIC MEAN ($\bar{X}$):		87.075	94585.387

SUMMARY OF STATISTICS

$\bar{X}$ = 87.075 mg/l

S_b^2 =

S_b =

UTL99% = ~~95.105 mg/l~~ 349.446 mg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2) $\frac{94585.387}{11} = 8598.672$

STANDARD DEVIATION (S_b) $\sqrt{8598.672} = 92.729$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

~~$87.075 + 2.718\left(1 + \frac{92.729}{12}\right)^{1/2} = 87.075 + 8.030 = 95.105$ mg/l~~

$87.075 + 2.718(1.041)(92.729) = 87.075 + 262.371 = 349.446$

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DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19
CHROMIUM (µg/l)

WELL NO	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	1.000 ±	0.0802
	03-15-94	1.000 ±	0.0802
	06-15-94	2.900	2.6136
	09-14-94	2.500	1.2166
MW-14	12-14-93	1.000 ±	0.0802
	03-15-94	1.000 ±	0.0802
	06-15-94	1.000 ±	0.0802
	09-14-94	1.000 ±	0.0802
MW-19	12-14-93	1.000 ±	0.0802
	03-15-94	1.000 ±	0.0802
	06-15-94	1.000 ±	0.0802
	09-14-94	1.000 ±	0.0802
* ARITHMATIC MEAN ($\bar{X}$):		1.283	4.6322

SUMMARY OF STATISTICS

$\bar{X}$ = 1.283 µg/l

S_b^2 =

S_b =

$UTL_{99\%}$ = ~~4.074~~ µg/l
3.119 µg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2) $\frac{4.6322}{11} = 0.421$

STANDARD DEVIATION (S_b) $\sqrt{0.421} = 0.649$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

~~$1.283 + 2.718\left(1 + \frac{0.649}{12}\right)^{1/2} = 1.283 + 2.791 = 4.074$ µg/l~~

$1.283 + 2.718(1.041)0.649 = 1.283 + 1.836 = 3.119$ µg/l

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DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19
COBALT (µg/l)

WELL NO	SAMPLING DATE	BACKGROUND CONCENTRATION* x	$(x-\bar{x})^2$
MW-1A	12-14-93	25.000 *	4.3402
	03-15-94	25.000 *	4.3402
	06-15-94	50.000	525.1736
	09-14-94	25.000 *	4.3402
MW-14	12-14-93	25.000 *	4.3402
	03-15-94	25.000 *	4.3402
	06-15-94	25.000 *	4.3402
	09-14-94	25.000 *	4.3402
MW-19	12-14-93	25.000 *	4.3402
	03-15-94	25.000 *	4.3402
	06-15-94	25.000 *	4.3402
	09-14-94	25.000 *	4.3402
ARITHMATIC MEAN ($\bar{x}$):		27.083	572.9158

SUMMARY OF STATISTICS

$\bar{x}$ = 27.083 µg/l

S_b^2 =

S_b =

$UTL_{99\%}$ = ~~30.522~~ µg/l
47.500 µg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2) $\frac{572.9158}{11} = 52.083$

STANDARD DEVIATION (S_b) $\sqrt{52.083} = 7.216$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

$\bar{x} + t(1+1/n)^{1/2}(S_b)$

$27.083 + 2.718\left(1+\frac{7.216}{12}\right)^{1/2} = 27.083 + 3.439 = 30.522$ µg/l

$27.083 + 2.718(1.041)(7.216) = 27.083 + 20.417 = 47.500$ µg/l

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METHOD REV. BY _____ DEPT _____ DATE _____

APPROVED BY _____ DEPT _____ DATE _____

DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19
FLOURIDE (mg/l)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	0.690	0.0590
	03-15-94	0.826	0.1391
	06-15-94	1.400	0.9082
	09-14-94	0.920	~~0.448~~ 0.2237
MW-14	12-14-93	0.310	0.0187
	03-15-94	0.250	0.0388
	06-15-94	0.340	0.0114
	09-14-94	0.340	0.0114
MW-19	12-14-93	0.140	0.0942
	03-15-94	0.050 *	0.1576
	06-15-94	0.050 *	0.1576
	09-14-94	0.050 *	0.1576
ARITHMATIC MEAN ($\bar{X}$):		0.447	1.9773

SUMMARY OF STATISTICS

$\bar{X}$ = 0.447 mg/l

S_b^2 =

S_b =

UTL99% = ~~3.213 mg/l~~ 1.647 mg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2)

$$\frac{1.9773}{11} = 0.1797$$

STANDARD DEVIATION (S_b)

$$\sqrt{0.1797} = 0.4239 = 0.424$$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

$$0.447 + 2.718\left(1 + \frac{.424}{12}\right)^{1/2} = 0.447 + 2.766 = 3.213 \text{ mg/l}$$

$$0.447 + 2.718(1.041)(.424) = 0.447 + 1.196 = 1.647 \text{ mg/l}$$

RFW 10-05 003/A-5/85
512-5643

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET 5 of ____

CLIENT/SUBJECT ASF W.O. NO. ____

TASK DESCRIPTION Ground Water Statistics TASK NO. 0040

PREPARED BY MWR DEPT ____ DATE 5/8/95

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

Determination of Upper Tolerance Limit for Bedrock Wells MW-1A, MW-14, MW-19
Dissolved Iron (µg/l)

Well No	Sampling Date	Background Concentration* x	$(x-\bar{x})^2$
MW-1A	12-14-93	11000.000	22800625
	03-15-94	2000.000	17850625
	06-15-94	21000.000	218300000
	09-14-94	34000.000	771450000
MW-14	12-14-93	1700.000	20475625
	03-15-94	1500.000	22325625
	06-15-94	1400.000	23280625
	09-14-94	1900.000	18705625
MW-19	12-14-93	50.000*	38130625
	03-15-94	50.000*	38130625
	06-15-94	50.000*	38130625
	09-14-94	50.000*	38130625
Arithmatic Mean ($\bar{x}$):		6225.000	1267711250

Summary of Statistics

$\bar{x} = 6225.000$ µg/l

$S_b^2 = 1.152 \times 10^8$ µg/l

$S_b = 10735.291$ µg/l

$UTL_{99\%} =$ 36599.017

Background Variance Concentration (S_b^2) $= \frac{1267711250}{11} = 115246477.272$

Standard Deviation (S_b) $= \sqrt{115246477.272} = 10735.291$

Upper Tolerance Limit @ 99% Confidence Level (UTL) $6225 + 2.718(1.041)10735. = 6225 + 30374 = 36599.017$

RFW 10-05-003/A-5/85

WESTON

SHEET 7 of ____

CLIENT/SUBJECT _____ W.O. NO. _____

TASK DESCRIPTION _____ TASK NO. _____

PREPARED BY _____ DEPT _____ DATE _____

MATH CHECK BY _____ DEPT _____ DATE _____

METHOD REV. BY _____ DEPT _____ DATE _____

APPROVED BY _____ DEPT _____ DATE _____

DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19

MANGANESE (µg/l)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* x	$(x-\bar{x})^2$
MW-1A	12-14-93	1200.000	49915.007
	03-15-94	1000.000	768398.34
	06-15-94	2200.000	1496748.3
	09-14-94	2700.000	2970165
MW-14	12-14-93	620.000	127151.67
	03-15-94	660.000	100225.01
	06-15-94	670.000	93993.34
	09-14-94	600.000	141815.01
MW-19	12-14-93	900.000	5865.007
	03-15-94	59.000	841959.17
	06-15-94	600.000	141815.01
	09-14-94	510.000	217700.01
* ARITHMATIC MEAN ($\bar{x}$):		976.583	6955750.9

SUMMARY OF STATISTICS

$\bar{x}$ = 976.583

S_b^2 =

S_b =

$UTL_{99\%}$ = ~~998.372 µg/l~~ 3124.690 µg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2)

$$\frac{6955750.9}{11} = 632340.99$$

STANDARD DEVIATION (S_b)

$$\sqrt{632340.99} = 795.199$$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

$$\cancel{976.583 + 2.718\left(1 + \frac{1}{12}\right)^{1/2} 759.199 = 976.583 + 21.789 = 998.372}$$

$$976.583 + 2.718(1.041)(759.199) = 976.583 + 2148.1065$$

$$= 3124.690 \text{ µg/l}$$

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET 4 of ____

CLIENT/SUBJECT ____ W.O. NO. ____

TASK DESCRIPTION ____ TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19
NICKEL (µg/l)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* x	$(x-\bar{x})^2$
MW-1A	12-14-93	20.000*	95.0625
	03-15-94	20.000*	95.0625
	06-15-94	71.000	1901.5625
	09-14-94	86.000	3164.0625
MW-14	12-14-93	20.000*	95.0625
	03-15-94	20.000*	95.0625
	06-15-94	20.000*	95.0625
	09-14-94	20.000*	95.0625
MW-19	12-14-93	20.000*	95.0625
	03-15-94	20.000*	95.0625
	06-15-94	20.000*	95.0625
	09-14-94	20.000*	95.0625
ARITHMATIC MEAN ($\bar{x}$):		29.750	5816.25

SUMMARY OF STATISTICS

$\bar{x} = 29.750$

$S_b^2 =$

$S_b =$

$UTL_{99\%} = \cancel{34.392}$ µg/l
94.813 µg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2): $\frac{5816.25}{11}$ 528.750

STANDARD DEVIATION (S_b): $\sqrt{528.750} = 22.995$

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL):

$\cancel{29.750 + 2.718\left(1+\frac{22.995}{12}\right)^{1/2} = 29.750 + 4.642 = 34.392 \mu g/l}$

$29.750 + 2.718(1.041)(22.995) = 94.813$ µg/l

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET 13 of ____

CLIENT/SUBJECT _____ W.O. NO. _____

TASK DESCRIPTION _____ TASK NO. _____

PREPARED BY _____ DEPT _____ DATE _____

MATH CHECK BY _____ DEPT _____ DATE _____

METHOD REV. BY _____ DEPT _____ DATE _____

APPROVED BY _____ DEPT _____ DATE _____

DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW-14, MW-19
SELENIUM (µg/l)

WELL NO	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	1.500*	2.3767
	03-15-94	5.000*	3.8350
	06-15-94	1.500*	2.3767
	09-14-94	3.000*	0.0017
MW-14	12-14-93	1.500*	2.3767
	03-15-94	6.000*	8.7517
	06-15-94	1.500*	2.3767
	09-14-94	3.000*	0.0017
MW-19	12-14-93	1.500*	2.3767
	03-15-94	6.000*	8.7517
	06-15-94	3.000	0.0017
	09-14-94	3.000*	0.0017
ARITHMATIC MEAN ($\bar{X}$):		3.042	33.2899

SUMMARY OF STATISTICS

$\bar{X} = 3.042$

$S_b^2 =$

$S_b =$

$UTL_{99\%} =$ ~~5.950 µg/l~~ 7.965 µg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2) $\frac{33.2899}{11} = 3.026$

STANDARD DEVIATION (S_b) $\sqrt{3.026} = 1.740$

UPPER TOLERANCE LIMIT @ 99% CONFIDENCE LEVEL (UTL)

~~$3.042 + 2.718\left(1+\frac{1.740}{12}\right)^{1/2} = 3.042 + 2.908 = 5.950$ µg/l~~

$3.042 + 2.718(1.041)(1.740) = 3.042 + 4.923 = 7.965$

WESTON
MANAGERS DESIGNERS CONSULTANTS

SHEET 15 of ____

CLIENT/SUBJECT ____ W.O. NO. ____

TASK DESCRIPTION ____ TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW-14, MW-19
SULFATE (mg/l)

WELL NO	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	240.000	3764570.1
	03-15-94	540.000	2690420.1
	06-15-94	460.000	2959260.1
	09-14-94	570.000	2592905.1
MW-14	12-14-93	11000.000	77787990
	03-15-94	11000.000	77787990
	06-15-94	1000.000	1392990.1
	09-14-94	1200.000	960890.1
MW-19	12-14-93	43.000	4567837.6
	03-15-94	32.000	4614978.1
	06-15-94	36.000	4597808.1
	09-14-94	42.000	4572113.1
ARITHMATIC MEAN ($\bar{X}$):		~~2063~~ 2180.250	1.88289×10^8

SUMMARY OF STATISTICS

$\bar{X}$ = 2180.25 mg/l

S_b^2 =

S_b =

$UTL_{99\%}$ = ~~2239.791~~ mg/l
13886.484 mg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2) 17117250

STANDARD DEVIATION (S_b) 4137.300

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL)

~~$2180.250 + 2.718\left(1 + \frac{4137.300}{12}\right)^{1/2} = 2180.250 + 50.541 = 2239.791$~~

$2180.250 + 2.718(1.041)4137.30 = 2180.250 + 11706.234 = 13886.484$

RFW 10-05-003/A-5/85

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET 10 of ____

CLIENT/SUBJECT ____ W.O. NO. ____

TASK DESCRIPTION ____ TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY ____ DEPT ____ DATE ____

DETERMINATION OF UPPER TOLERANCE LIMIT FOR BEDROCK WELLS MW-1A, MW14, MW19

Zinc (µg/l)

WELL No	SAMPLING DATE	BACKGROUND CONCENTRATION* X	$(X-\bar{X})^2$
MW-1A	12-14-93	70.000	540.5625
	03-15-94	56.000	86.5625
	06-15-94	160.000	12825.563
	09-14-94	150.000	10660.583
MW-14	12-14-93	20.000	715.5625
	03-15-94	10.000 ←	1350.5625
	06-15-94	10.000 ←	1350.5625
	09-14-94	10.000 ←	1350.5625
MW-19	12-14-93	10.000 ←	1350.5625
	03-15-94	10.000 ←	1350.5625
	06-15-94	10.000 ←	1350.5625
	09-14-94	45.000	~~1350.5625~~ 3.0625
ARITHMATIC MEAN ($\bar{X}$):		46.750	32934.271

SUMMARY OF STATISTICS

$\bar{X}$ = 46.750 µg/l

S_b^2 =

S_b =

$UTL_{99\%}$ = ~~53.159~~ µg/l

201.571 µg/l

BACKGROUND VARIANCE CONCENTRATION (S_b^2) $\frac{32934.271}{11} = 2994.025$

STANDARD DEVIATION (S_b) 54.718

UPPER TOLERANCE LIMIT @99% CONFIDENCE LEVEL (UTL) ~~$46.750 + 2.718\left(1 + \frac{54.718}{12}\right)^{1/2} = 46.750 + 6.409 = 53.159$ µg/l~~

$46.750 + 2.718(1.041)\,54.718 = 46.750 + 154.821 = 201.571$

RFW 10-05-003/A-5/85

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-23
FCID: OHD017497587 NUMBER OF PARAMETERS: 83
SELECTED DATE: 12/14/93

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
1,1,1-Trichloroethane		ND<10.000	ug/l		8260
1,1,2-Trichloroethane		ND<10.000	ug/l		8260
1,1-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,1-Dichloroethane		ND<10.000	UG/L		8260
1,2,3-Trichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,2-Dichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethane		ND<10.000	ug/l		8260
1,1,1,2-Tetrachloroethane		ND<10.000	ug/l		8260
1,2-Dibromoethane; Ethylene dibromide		ND<10.000	ug/l		8260
trans-1,4-Dichloro-2butene		ND<20.000	ug/l		8260
2-Butanone (Methyl ethyl ketone)		ND<10.000	ug/l		8260
2-Hexanone		ND<10.000	ug/l		8260
Allyl chloride (3-chloro-1-propene)		ND<10.000	UG/L		8260
Acetone		5.000	UG/L		8260
Acrolein		ND<20.000	UG/L		8260
Acrylonitrile		ND<20.000	UG/L		8260
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		160.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Beryllium, dissolved		ND<5.000	ug/l		6010
Benzene		ND<10.000	ug/l		8260
Dibromochloromethane		ND<10.000	ug/l		8260
Bromodichloromethane		ND<10.000	ug/l		8260
Bromoform		ND<10.000	ug/l		8260
Carbon tetrachloride		ND<10.000	ug/l		8260
Carbon Disulfide		ND<10.000	UG/L		8260
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		0.700	ug/l		7131
Chlorobenzene		ND<10.000	ug/l		8260
Chloromethane		ND<10.000	UG/L		8260
Chloride		26.000	mg/l		
Chloroprene		ND<10.000	ug/l		8260
cis-1,3-Dichloropropene (-propylene)		ND<10.000	ug/l		8260
Chloroethane		ND<10.000	UG/L		8260
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		2100.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Cyanide, total		ND<0.010	mg/l		9012
1,2-Dibromo-3-chloropropane; DBCP		ND<10.000	ug/l		8260
Dichlorodifluoromethane		ND<10.000	UG/L		8260
Dibromomethane		0.500	ug/l		8260
Ethyl cyanide or Propanenitrile		ND<20.000	ug/l		8260
Ethylbenzene		ND<10.000	ug/l		8260
Iron, dissolved		11000.000	ug/l		
Fluoride		0.220	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Isobutyl alcohol		ND<100	ug/l		8260
Iodomethane		ND<10.000	UG/L		8260
Methacrylonitrile		ND<20.000	ug/l		8260
Bromomethane (Methylbromide)		ND<10.000	UG/L		8260
Acetonitrile; Methyl cyanide		ND<20.000	ug/l		8260
Dichloromethane (Methylene chloride)		ND<10.000	UG/L		8260
Methylisobutylketone (MIBK) (4-Me-2-penta		ND<10.000	ug/l		8260
Manganese, dissolved		5200.000	ug/l		6010
Nitrate		ND<0.050	mg/l		9200
Sodium, dissolved		41000.000	ug/l		6010

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-23
FCID: OHD017497587 NUMBER OF PARAMETERS: 83
SELECTED DATE: 12/14/93

Nickel, dissolved	ND<40.000	ug/l	6010
Lead, dissolved	ND<3.000	ug/l	7470
Phenols, total	ND<0.010	mg/l	9066
Sulfide, total	ND<1.000	mg/l	
Sulfate, total	1200.000	mg/l	9036
Antimony, dissolved	ND<10.000	ug/l	7041
Selenium, dissolved	ND<3.000	ug/l	7740
Tin, dissolved	ND<500	ug/l	
Styrene	ND<10.000	ug/l	8260
Trichloroethene (-ethylene)	ND<10.000	ug/l	8260
Trichlorofluoromethane	ND<10.000	UG/L	8260
Total Organic Carbon	1.100	mg/l	9060
Total Organic Halogens, Halides	ND<5.000	ug/l	9020
Tetrachloroethene (-ethylene)	ND<10.000	ug/l	8260
1,1,2,2-Tetrachloroethane	ND<10.000	ug/l	8260
Thallium, dissolved	ND<3.000	mg/l	7841
Toluene	ND<10.000	ug/l	8260
trans-1,3-Dichloropropene (-propylene)	ND<10.000	ug/l	8260
Vinyl chloride	ND<10.000	UG/L	8260
Vanadium, dissolved	ND<50.000	ug/l	6010
Vinyl acetate	ND<10.000	ug/l	8260
Xylene	ND<10.000	ug/l	8260
Zinc, dissolved	ND<20.000	ug/l	6010
pH, Field	6.900	SU	9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-23
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 03/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		66.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		4.600	ug/l		7131
Chloride		240.000	mg/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1300.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		120.000	ug/l		
Fluoride		0.120	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		4400.000	ug/l		6010
Nitrate		0.220	mg/l		9200
Sodium, dissolved		12000.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		ND<0.010	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		280.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<12.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		0.660	mg/l		9060
Total Organic Halogens, Halides		ND<5.000	ug/l		9020
Zinc, dissolved		21.000	ug/l		6010
pH, Field		6.000	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-23
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 06/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		76.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		ND<0.300	ug/l		7131
Chloride		87.000	mg/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1580.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		17000.000	ug/l		
Fluoride		0.150	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		4000.000	ug/l		6010
Nitrate		ND<0.050	mg/l		9200
Sodium, dissolved		17000.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		ND<0.010	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		750.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<3.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		0.770	mg/l		9060
Total Organic Halogens, Halides		8.300	ug/l		9020
Zinc, dissolved		46.000	ug/l		6010
pH, Field		6.400	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-23
FCID: OHD017497587 NUMBER OF PARAMETERS: 30
SELECTED DATE: 09/14/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		34.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		34.000	mg/l		403
Cadmium, dissolved		ND<0.300	ug/l		7131
Chloride		240.000	mg/l		
Chloroform	a	ND<10.000	ug/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1071.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		30000.000	ug/l		
Fluoride		0.110	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		3700.000	ug/l		6010
Nitrate		ND<0.050	mg/l		9200
Sodium, dissolved		8800.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		ND<0.010	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		170.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<6.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		1.200	mg/l		9060
Total Organic Halogens, Halides		11.000	ug/l		9020
Zinc, dissolved		59.000	ug/l		6010
pH, Field		6.300	SU		9040

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GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-1A
FCID: OHD017497587 NUMBER OF PARAMETERS: 83
SELECTED DATE: 12/14/93

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
1,1,1-Trichloroethane		ND<10.000	ug/l		8260
1,1,2-Trichloroethane		ND<10.000	ug/l		8260
1,1-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,1-Dichloroethane		ND<10.000	UG/L		8260
1,2,3-Trichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,2-Dichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethane		ND<10.000	ug/l		8260
1,1,1,2-Tetrachloroethane		ND<10.000	ug/l		8260
1,2-Dibromoethane; Ethylene dibromide		ND<10.000	ug/l		8260
trans-1,4-Dichloro-2butene		ND<20.000	ug/l		8260
2-Butanone (Methyl ethyl ketone)		ND<10.000	ug/l		8260
2-Hexanone		ND<10.000	ug/l		8260
Allyl chloride (3-chloro-1-propene)		ND<10.000	UG/L		8260
Acetone		3.000	UG/L		8260
Acrolein		ND<20.000	UG/L		8260
Acrylonitrile		ND<20.000	UG/L		8260
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		ND<20.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Beryllium, dissolved		ND<5.000	ug/l		6010
Benzene		ND<10.000	ug/l		8260
Dibromochloromethane		ND<10.000	ug/l		8260
Bromodichloromethane		ND<10.000	ug/l		8260
Bromoform		ND<10.000	ug/l		8260
Carbon tetrachloride		ND<10.000	ug/l		8260
Carbon Disulfide		ND<10.000	UG/L		8260
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		0.760	ug/l		7131
Chlorobenzene		ND<10.000	ug/l		8260
Chloromethane		ND<10.000	UG/L		8260
Chloride		97.000	mg/l		
Chloroprene		ND<10.000	ug/l		8260
cis-1,3-Dichloropropene (-propylene)		ND<10.000	ug/l		8260
Chloroethane		ND<10.000	UG/L		8260
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1100.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		16.000	ug/l		7211
Cyanide, total		ND<0.010	mg/l		9012
1,2-Dibromo-3-chloropropane; DBCP		ND<10.000	ug/l		8260
Dichlorodifluoromethane		ND<10.000	UG/L		8260
Dibromomethane		0.500	ug/l		8260
Ethyl cyanide or Propanenitrile		ND<20.000	ug/l		8260
Ethylbenzene		ND<10.000	ug/l		8260
Iron, dissolved		11000.000	ug/l		
Fluoride		0.690	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Isobutyl alcohol		ND<100	ug/l		8260
Iodomethane		ND<10.000	UG/L		8260
Methacrylonitrile		ND<20.000	ug/l		8260
Bromomethane (Methylbromide)		ND<10.000	UG/L		8260
Acetonitrile; Methyl cyanide		ND<20.000	ug/l		8260
Dichloromethane (Methylene chloride)		ND<10.000	UG/L		8260
Methylisobutylketone (MIBK) (4-Me-2-penta		ND<10.000	ug/l		8260
Manganese, dissolved		1200.000	ug/l		6010
Nitrate		0.520	mg/l		9200
Sodium, dissolved		61000.000	ug/l		6010

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GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-1A
FCID: OHD017497587 NUMBER OF PARAMETERS: 83
SELECTED DATE: 12/14/93

Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		ND<0.010	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		240.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<3.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Styrene		ND<10.000	ug/l		8260
Trichloroethene (-ethylene)		ND<10.000	ug/l		8260
Trichlorofluoromethane		ND<10.000	UG/L		8260
Total Organic Carbon		0.600	mg/l		9060
Total Organic Halogens, Halides		8.000	ug/l		9020
Tetrachloroethene (-ethylene)		ND<10.000	ug/l		8260
1,1,2,2-Tetrachloroethane		ND<10.000	ug/l		8260
Thallium, dissolved		ND<3.000	mg/l		7841
Toluene		ND<10.000	ug/l		8260
trans-1,3-Dichloropropene (-propylene)		ND<10.000	ug/l		8260
Vinyl chloride		ND<10.000	UG/L		8260
Vanadium, dissolved		ND<50.000	ug/l		6010
Vinyl acetate		ND<10.000	ug/l		8260
Xylene		ND<10.000	ug/l		8260
Zinc, dissolved		70.000	ug/l		6010
pH, Field		3.500	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-1A
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 03/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		ND<20.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		3.200	ug/l		7131
Chloride		310.000	mg/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1430.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		11.000	ug/l		7211
Iron, dissolved		2000.000	ug/l		
Fluoride		0.820	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		1000.000	ug/l		6010
Nitrate		0.480	mg/l		9200
Sodium, dissolved		140000.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		0.034	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		540.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<12.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		1.100	mg/l		9060
Total Organic Halogens, Halides		20.000	ug/l		9020
Zinc, dissolved		56.000	ug/l		6010
pH, Field		3.200	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-1A
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 06/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		ND<20.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		2.000	ug/l		7131
Chloride		220.000	mg/l		
Cobalt, Dissolved		50.000	ug/l		6010
Specific Conductivity		1640.000	umhos/cm		
Chromium, dissolved		2.900	ug/l		7191
Copper, dissolved		32.000	ug/l		7211
Iron, dissolved		21000.000	ug/l		
Fluoride		1.400	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		2200.000	ug/l		6010
Nitrate		ND<0.050	mg/l		9200
Sodium, dissolved		110000.000	ug/l		6010
Nickel, dissolved		71.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		ND<0.010	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		460.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<3.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		1.700	mg/l		9060
Total Organic Halogens, Halides		14.000	ug/l		9020
Zinc, dissolved		160.000	ug/l		6010
pH, Field		4.100	SU		9040

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GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-1A
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 09/14/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		1.600	ug/l		7131
Chloride		270.000	mg/l		
Chloroform	a	ND<10.000	ug/l		8260
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1750.000	umhos/cm		
Chromium, dissolved		2.500	ug/l		7191
Copper, dissolved		34.000	ug/l		7211
Iron, dissolved		34000.000	ug/l		
Fluoride		0.920	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		2700.000	ug/l		6010
Nitrate		ND<0.250	mg/l		9200
Sodium, dissolved		120000.000	ug/l		6010
Nickel, dissolved		86.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		ND<0.010	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		570.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<6.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		17.000	mg/l		9060
Total Organic Halogens, Halides		17.000	ug/l		9020
Zinc, dissolved		150.000	ug/l		6010
pH, Field		4.300	SU		9040

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GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-14
FCID: OHD017497587 NUMBER OF PARAMETERS: 83
SELECTED DATE: 12/14/93

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
1,1,1-Trichloroethane		ND<10.000	ug/l		8260
1,1,2-Trichloroethane		ND<10.000	ug/l		8260
1,1-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,1-Dichloroethane		ND<10.000	UG/L		8260
1,2,3-Trichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,2-Dichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethane		ND<10.000	ug/l		8260
1,1,1,2-Tetrachloroethane		ND<10.000	ug/l		8260
1,2-Dibromoethane; Ethylene dibromide		ND<10.000	ug/l		8260
trans-1,4-Dichloro-2butene		ND<20.000	ug/l		8260
2-Butanone (Methyl ethyl ketone)		ND<10.000	ug/l		8260
2-Hexanone		ND<10.000	ug/l		8260
Allyl chloride (3-chloro-1-propene)		ND<10.000	UG/L		8260
Acetone		3.000	UG/L		8260
Acrolein		ND<20.000	UG/L		8260
Acrylonitrile		ND<20.000	UG/L		8260
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		210.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Beryllium, dissolved		ND<5.000	ug/l		6010
Benzene		ND<10.000	ug/l		8260
Dibromochloromethane		ND<10.000	ug/l		8260
Bromodichloromethane		ND<10.000	ug/l		8260
Bromoform		ND<10.000	ug/l		8260
Carbon tetrachloride		ND<10.000	ug/l		8260
Carbon Disulfide		ND<10.000	UG/L		8260
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		ND<0.300	ug/l		7131
Chlorobenzene		ND<10.000	ug/l		8260
Chloromethane		ND<10.000	UG/L		8260
Chloride		28.000	mg/l		
Chloroform	a	ND<10.000	ug/l		8260
Chloroprene		ND<10.000	ug/l		8260
cis-1,3-Dichloropropene (-propylene)		ND<10.000	ug/l		8260
Chloroethane		ND<10.000	UG/L		8260
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		2200.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Cyanide, total		ND<0.010	mg/l		9012
1,2-Dibromo-3-chloropropane; DBCP		ND<10.000	ug/l		8260
Dichlorodifluoromethane		ND<10.000	UG/L		8260
Dibromomethane		0.400	ug/l		8260
Ethyl cyanide or Propanenitrile		ND<20.000	ug/l		8260
Ethylbenzene		ND<10.000	ug/l		8260
Iron, dissolved		1700.000	ug/l		
Fluoride		0.310	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Isobutyl alcohol		ND<100	ug/l		8260
Iodomethane		ND<10.000	UG/L		8260
Methacrylonitrile		ND<20.000	ug/l		8260
Bromomethane (Methylbromide)		ND<10.000	UG/L		8260
Acetonitrile; Methyl cyanide		ND<20.000	ug/l		8260
Dichloromethane (Methylene chloride)		ND<10.000	UG/L		8260
Methylisobutylketone (MIBK) (4-Me-2-penta		ND<10.000	ug/l		8260
Manganese, dissolved		620.000	ug/l		6010
Nitrate		ND<0.050	mg/l		9200

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GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-14
FCID: OHD017497587 NUMBER OF PARAMETERS: 83
SELECTED DATE: 12/14/93

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Sodium, dissolved		39000.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Sulfide, total		1.900	mg/l		
Sulfate, total		1100.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<3.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Styrene		ND<10.000	ug/l		8260
Trichloroethene (-ethylene)		ND<10.000	ug/l		8260
Trichlorofluoromethane		ND<10.000	UG/L		8260
Total Organic Carbon		3.300	mg/l		9060
Total Organic Halogens, Halides		7.400	ug/l		9020
Tetrachloroethene (-ethylene)		ND<10.000	ug/l		8260
1,1,2,2-Tetrachloroethane		ND<10.000	ug/l		8260
Thallium, dissolved		ND<3.000	mg/l		7841
Toluene		ND<10.000	ug/l		8260
trans-1,3-Dichloropropene (-propylene)		ND<10.000	ug/l		8260
Vinyl chloride		ND<10.000	UG/L		8260
Vanadium, dissolved		50.000	ug/l		6010
Vinyl acetate		ND<10.000	ug/l		8260
Xylene		ND<10.000	ug/l		8260
Zinc, dissolved		20.000	ug/l		6010
pH, Field		7.200	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-14
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 03/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		200.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		ND<0.300	ug/l		7131
Chloride		32.000	mg/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1920.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		1500.000	ug/l		
Fluoride		0.250	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		660.000	ug/l		6010
Nitrate		ND<0.050	mg/l		9200
Sodium, dissolved		37000.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		0.260	mg/l		9066
Sulfide, total		1.200	mg/l		
Sulfate, total		1100.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<12.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		2.200	mg/l		9060
Total Organic Halogens, Halides		10.000	ug/l		9020
Zinc, dissolved		ND<20.000	ug/l		6010
pH, Field		6.200	SU		9040

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GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-14
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 06/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		200.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		ND<0.300	ug/l		7131
Chloride		23.000	mg/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		2050.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		1400.000	ug/l		
Fluoride		0.340	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		670.000	ug/l		6010
Nitrate		ND<0.050	mg/l		9200
Sodium, dissolved		39000.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		0.012	mg/l		9066
Sulfide, total		2.500	mg/l		
Sulfate, total		1000.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<3.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		1.200	mg/l		9060
Total Organic Halogens, Halides		6.800	ug/l		9020
Zinc, dissolved		ND<20.000	ug/l		6010
pH, Field		7.100	SU		9040

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GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-14
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 09/14/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		200.000	mg/l		403
Cadmium, dissolved		ND<0.300	ug/l		7131
Chloride		26.000	mg/l		
Chloroform	a	ND<10.000	ug/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1950.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		1900.000	ug/l		
Fluoride		0.340	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		600.000	ug/l		6010
Nitrate		0.052	mg/l		9200
Sodium, dissolved		38000.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		0.020	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		1200.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<6.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		9.300	mg/l		9060
Total Organic Halogens, Halides		62.000	ug/l		9020
Zinc, dissolved		ND<20.000	ug/l		6010
pH, Field		6.800	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-19
FCID: OHD017497587 NUMBER OF PARAMETERS: 84
SELECTED DATE: 12/14/93

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
1,1,1-Trichloroethane		ND<10.000	ug/l		8260
1,1,2-Trichloroethane		ND<10.000	ug/l		8260
1,1-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,1-Dichloroethane		ND<10.000	UG/L		8260
1,2,3-Trichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethene (-ethylene)		ND<10.000	UG/L		8260
1,2-Dichloropropane		ND<10.000	ug/l		8260
1,2-Dichloroethane		ND<10.000	ug/l		8260
1,1,1,2-Tetrachloroethane		ND<10.000	ug/l		8260
1,2-Dibromoethane; Ethylene dibromide		ND<10.000	ug/l		8260
trans-1,4-Dichloro-2butene		ND<20.000	ug/l		8260
2-Butanone (Methyl ethyl ketone)		ND<10.000	ug/l		8260
2-Hexanone		ND<10.000	ug/l		8260
Allyl chloride (3-chloro-1-propene)		ND<10.000	UG/L		8260
Acetone		3.000	UG/L		8260
Acrolein		ND<20.000	UG/L		8260
Acrylonitrile		ND<20.000	UG/L		8260
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		ND<20.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Beryllium, dissolved		ND<5.000	ug/l		6010
Benzene		ND<10.000	ug/l		8260
Dibromochloromethane		ND<10.000	ug/l		8260
Bromodichloromethane		ND<10.000	ug/l		8260
Bromoform		ND<10.000	ug/l		8260
Carbon tetrachloride		ND<10.000	ug/l		8260
Carbon Disulfide		ND<10.000	UG/L		8260
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		ND<0.300	ug/l		7131
Chlorobenzene		ND<10.000	ug/l		8260
Chloromethane		ND<10.000	UG/L		8260
Chloride		16.000	mg/l		
Chloroform	a	1.000	ug/l		8260
Chloroprene		ND<10.000	ug/l		8260
cis-1,3-Dichloropropene (-propylene)		ND<10.000	ug/l		8260
Chloroethane		ND<10.000	UG/L		8260
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		170.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Cyanide, total		ND<0.010	mg/l		9012
1,2-Dibromo-3-chloropropane; DBCP		ND<10.000	ug/l		8260
Dichlorodifluoromethane		ND<10.000	UG/L		8260
Dibromomethane		0.500	ug/l		8260
Ethyl cyanide or Propanenitrile		ND<20.000	ug/l		8260
Ethylbenzene		ND<10.000	ug/l		8260
Iron, dissolved		ND<100	ug/l		
Fluoride		0.140	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Isobutyl alcohol		ND<100	ug/l		8260
Iodomethane		ND<10.000	UG/L		8260
Methacrylonitrile		ND<20.000	ug/l		8260
Bromomethane (Methylbromide)		ND<10.000	UG/L		8260
Acetonitrile; Methyl cyanide		ND<20.000	ug/l		8260
Dichloromethane (Methylene chloride)		ND<10.000	UG/L		8260
Methylisobutylketone (MIBK) (4-Me-2-penta		ND<10.000	ug/l		8260
Manganese, dissolved		900.000	ug/l		6010
Nitrate		1.400	mg/l		9200

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-19
FCID: OHD017497587 NUMBER OF PARAMETERS: 84
SELECTED DATE: 12/14/93

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Sodium, dissolved		ND<7600	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		0.010	mg/l		9066
Sulfide, total		1.600	mg/l		
Sulfate, total		43.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<3.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Styrene		ND<10.000	ug/l		8260
Trichloroethene (-ethylene)		ND<10.000	ug/l		8260
Trichlorofluoromethane		ND<10.000	UG/L		8260
Total Organic Carbon		1.900	mg/l		9060
Total Organic Halogens, Halides		ND<5.000	ug/l		9020
Tetrachloroethene (-ethylene)		ND<10.000	ug/l		8260
1,1,2,2-Tetrachloroethane		ND<10.000	ug/l		8260
Thallium, dissolved		ND<3.000	mg/l		7841
Toluene		ND<10.000	ug/l		8260
trans-1,3-Dichloropropene (-propylene)		ND<10.000	ug/l		8260
Vinyl chloride		ND<10.000	UG/L		8260
Vanadium, dissolved		ND<50.000	ug/l		6010
Vinyl acetate		ND<10.000	ug/l		8260
Xylene		ND<10.000	ug/l		8260
Zinc, dissolved		ND<20.000	ug/l		6010
pH, Field		6.200	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-19
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 03/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		ND<20.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		0.890	ug/l		7131
Chloride		13.000	mg/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1430.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		ND<100	ug/l		
Fluoride		ND<0.100	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		59.000	ug/l		6010
Nitrate		1.100	mg/l		9200
Sodium, dissolved		4800.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		ND<0.010	mg/l		9066
Sulfide, total		ND<1.000	mg/l		
Sulfate, total		32.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<12.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		1.100	mg/l		9060
Total Organic Halogens, Halides		ND<5.000	ug/l		9020
Zinc, dissolved		ND<20.000	ug/l		6010
pH, Field		5.400	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-19
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 06/15/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Alk bica - NOT IN MASTER PARAMETER FILE		ND<20.000	mg/l		403
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		0.330	ug/l		7131
Chloride		5.100	mg/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1430.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		ND<3.000	ug/l		7211
Iron, dissolved		ND<100	ug/l		
Fluoride		ND<0.100	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		600.000	ug/l		6010
Nitrate		1.600	mg/l		9200
Sodium, dissolved		5400.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		0.010	mg/l		9066
Sulfide, total		1.200	mg/l		
Sulfate, total		36.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		3.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		0.340	mg/l		9060
Total Organic Halogens, Halides		7.600	ug/l		9020
Zinc, dissolved		ND<20.000	ug/l		6010
pH, Field		5.400	SU		9040

04/27/95
GROUND WATER DATA BASE PRINTOUT

FACILITY: AMERICAN STEEL FOUNDRIES,ALLIANCE,OH WELL: MW-19
FCID: OHD017497587 NUMBER OF PARAMETERS: 29
SELECTED DATE: 09/14/94

PARAMETER	Rep	RESULT	UNITS	DQ	METHD
Silver, dissolved		ND<1.000	ug/l		7761
Arsenic, dissolved		ND<3.000	ug/l		7060
Barium, dissolved		ND<50.000	ug/l		6010
Alkalinity (calcium carbonate)		ND<20.000	mg/l		403
Cadmium, dissolved		0.660	ug/l		7131
Chloride		4.800	mg/l		
Chloroform	a	0.400	ug/l		
Cobalt, Dissolved		ND<50.000	ug/l		6010
Specific Conductivity		1575.000	umhos/cm		
Chromium, dissolved		ND<2.000	ug/l		7191
Copper, dissolved		7.700	ug/l		7211
Iron, dissolved		ND<100	ug/l		
Fluoride		ND<0.100	mg/l		340.2
Mercury, dissolved		ND<0.200	ug/l		
Manganese, dissolved		510.000	ug/l		6010
Nitrate		1.200	mg/l		9200
Sodium, dissolved		5800.000	ug/l		6010
Nickel, dissolved		ND<40.000	ug/l		6010
Lead, dissolved		ND<3.000	ug/l		7470
Phenols, total		0.011	mg/l		9066
Sulfide, total		1.300	mg/l		
Sulfate, total		42.000	mg/l		9036
Antimony, dissolved		ND<10.000	ug/l		7041
Selenium, dissolved		ND<6.000	ug/l		7740
Tin, dissolved		ND<500	ug/l		
Total Organic Carbon		26.000	mg/l		9060
Total Organic Halogens, Halides		ND<5.000	ug/l		9020
Zinc, dissolved		45.000	ug/l		6010
pH, Field		5.500	SU		9040

APPENDIX E

STANDARD SAMPLING FORMS AND DOCUMENTATION

FIELD SURVEY FORM

Sample I.D.: _____

Facility: _____

RFW #: _____

ɔe Sample: (circle one) Ground Water Surface Water Leachate Other: _____

Equipment Used: Purging _____ Dedicated (Y/N)

Sampling _____ Dedicated (Y/N)

PURGING INFORMATION

Purge Date: _____ Start Purge: _____ (2400 Hr. Clock) End Purge: _____

Water Volume in Casing (gallons): _____ Volume Purged (gallons): _____

MEASUREMENTS

Well Diameter _____ (inches)

Stick Up _____ (ft.)

Ref. Measuring Pt. _____

Well Elevation _____ (ft./msl)

Water Level _____ (ft.)

Ground Water Elev. _____ (ft./msl)

Well Depth _____ (ft.)

pH _____ _____ _____ _____ (std.)

SC _____ _____ _____ _____ (umhos/cm)

Temp. _____ _____ _____ _____ (°C)

Well Stabilization/Recharge Grid

COMMENTS

Sample Appearance/Odor : _____

Weather Conditions: _____

Other: _____

Sampler Name (Print): _____ Signature: _____

EAGLE PICHER

ENVIRONMENTAL SCIENCE
& TECHNOLOGY DEPT.
200 B.J. TUNNELL BLVD., MIAMI, OK 74354
1-800-331-7425

Specially Cleaned Sample Container

Lot #:

DATE:	TIME:	COLLECTED BY:

SAMPLING SITE:

SAMPLE TYPE:
☐ Grab ☐ Composite ☐ Other _____

TESTS REQUIRED:	PRESERVATIVE

Anal Use C

Custody Transfer Record/Lab Work Request

Page _____ of _____

Client _____
Est. Final Proj. Sampling Date _____
Work Order # _____
Project Contact/Phone # _____
AD Project Manager _____
QC _____ Del _____ TAT _____
Date Rec'd _____ Date Due _____
Account # _____

Refrigerator #																
#/Type Container	Liquid															
	Solid															
Volume	Liquid															
	Solid															
Preservatives																
ANALYSES REQUESTED →		ORGANIC								INORG						
		VOA	BNA	Pest/ PCB	Herb					Metal	CN					

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓)	Matrix	Date Collected													

Special Instructions:

DATE/REVISIONS:

_____ 1. _____
_____ 2. _____
_____ 3. _____
_____ 4. _____
_____ 5. _____
_____ 6. _____

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

_____ L372 _____ L373 _____ L375 _____ L377 _____ L378 Ref# _____ Cooler# _____

G77-596a

SEMIANNUAL GROUNDWATER MONITORING RESULTS SEPTEMBER 1995 AMERICAN STEEL FOUNDRIES SEBRING, OHIO

Prepared for

AMERICAN STEEL FOUNDRIES
Chicago, Illinois

Prepared by

ROY F. WESTON, INC.
Three Hawthorn Parkway
Vernon Hills, Illinois 60061

November 1995

Roy F. Weston, Inc.
Suite 400
3 Hawthorn Parkway
Vernon Hills, Illinois 60061-1450
708-918-4000 • Fax 708-918-4055

16 November 1995

Ms. Bernadette Wellman
Manager, Environmental Affairs
American Steel Foundries
10 South Riverside Plaza
10th Floor
Chicago, IL 60606

Work Order No. 10752-005-001

Re: Semiannual Groundwater Sampling and Analysis
American Steel Foundries
Sebring Landfill, Alliance, Ohio

Dear Ms. Wellman:

Roy F. Weston, Inc. (WESTON®) is pleased to submit this report, which details the results of the September 1995 semiannual groundwater sampling of the groundwater monitoring network at the American Steel Foundries, Inc. (ASF) Sebring Landfill (facility) located near Alliance, Ohio. Sampling was completed by WESTON personnel on 19 and 20 September 1995. Laboratory analysis was performed by WESTON Environmental Metrics, Inc. (WESTON EMI) located in University Park, Illinois.

MONITORING PROGRAM DESCRIPTION

The groundwater monitoring network at the facility consists of four upgradient monitoring wells and 11 downgradient compliance monitoring wells. Groundwater occurs in two different hydraulically interconnected stratigraphic units, which constitute one aquifer. Since groundwater chemistry can be quite variable between the two stratigraphic units, independent statistical analyses have been made for wells screened in the bedrock and wells screened in the mine spoils. Table 1 presents a summary of upgradient and downgradient wells that are screened within each of these stratigraphic units. Figure 1 shows the location of each of these monitoring wells.

In accordance with a sampling approach approved by the Ohio Environmental Protection Agency (OEPA) in a 27 April 1995 meeting, the groundwater monitoring program includes the sampling of all monitoring wells on a semiannual basis for the parameters listed in Table 2.

The results of the September 1995 semiannual groundwater sampling and statistical analysis are presented in the following paragraphs.

ANALYTICAL RESULTS

Groundwater samples were analyzed for the presence of arsenic, barium, cadmium, cobalt, chromium, iron, lead, manganese, mercury, nickel, selenium, silver, zinc, fluoride, chloride, sulfate, and total phenolics. In addition, pH and specific conductance were measured in the field by sampling personnel. Samples were analyzed by WESTON EMI, and results of these analyses were validated by a WESTON chemist. Table 3 presents a summary of the results of these analyses. The laboratory and data validation reports are presented in Attachment A.

STATISTICAL ANALYSIS

A tolerance interval approach was utilized to compare background monitoring well data to downgradient monitoring well data. Tolerance intervals were calculated from the data collected from the initial four quarters of groundwater sampling (1993 and 1994). In order to increase the statistical base for groundwater occurring in the mine spoils, analytical results obtained for upgradient mine spoils well MW-23 during the March 1995 sampling event were included in the calculation of tolerance intervals. Table 4 presents the upper tolerance level (tolerance interval for pH) to which all downgradient analytical data are compared. If all of the background analytical data for a specific parameter were non-detects, the upper tolerance level was set to two times the detection limit for that parameter.

If the analytical results for a given parameter exceed the upper tolerance level, or tolerance interval for pH, then a statistically significant change in groundwater chemistry may have occurred. A detailed description of the calculation of tolerance intervals was presented in the *Revised Groundwater Monitoring Plan*, that was submitted to the OEPA in September 1995. This statistical approach has yet to be reviewed and approved by the OEPA.

A comparison of the September 1995 analytical results to background tolerance intervals is presented below.

Groundwater Occurring in Bedrock

Comparisons were made between analytical results of groundwater samples collected from wells screened in bedrock and upper tolerance limits calculated from upgradient bedrock monitoring wells MW-1A, MW-14, and MW-19. Table 5 presents a summary of parameters that exceeded upper tolerance levels.

Groundwater Occurring in Mine Spoils

Comparisons were made between analytical results of groundwater samples collected from wells screened in mine spoils and upper tolerance limits calculated from upgradient monitoring well MW-23, which is screened in mine spoils. Table 6 presents a summary of parameters that exceeded upper tolerance levels.

All other parameters were either not detected or were detected at concentrations that were within their respective tolerance intervals.

GROUNDWATER FLOW CONDITIONS

Groundwater elevation data were collected prior to collection of groundwater samples. Table 7 presents a summary of the groundwater measurement data. Results of these measurements were used to construct the groundwater contour map, which is presented as Figure 2. As this map shows, general groundwater flow direction is southwest with components to the west.

If you have any questions regarding the information contained in this letter, please do not hesitate to contact either of us at (708) 918-4000.

Very truly yours,

ROY F. WESTON, INC.

Gregory S. Kinsall

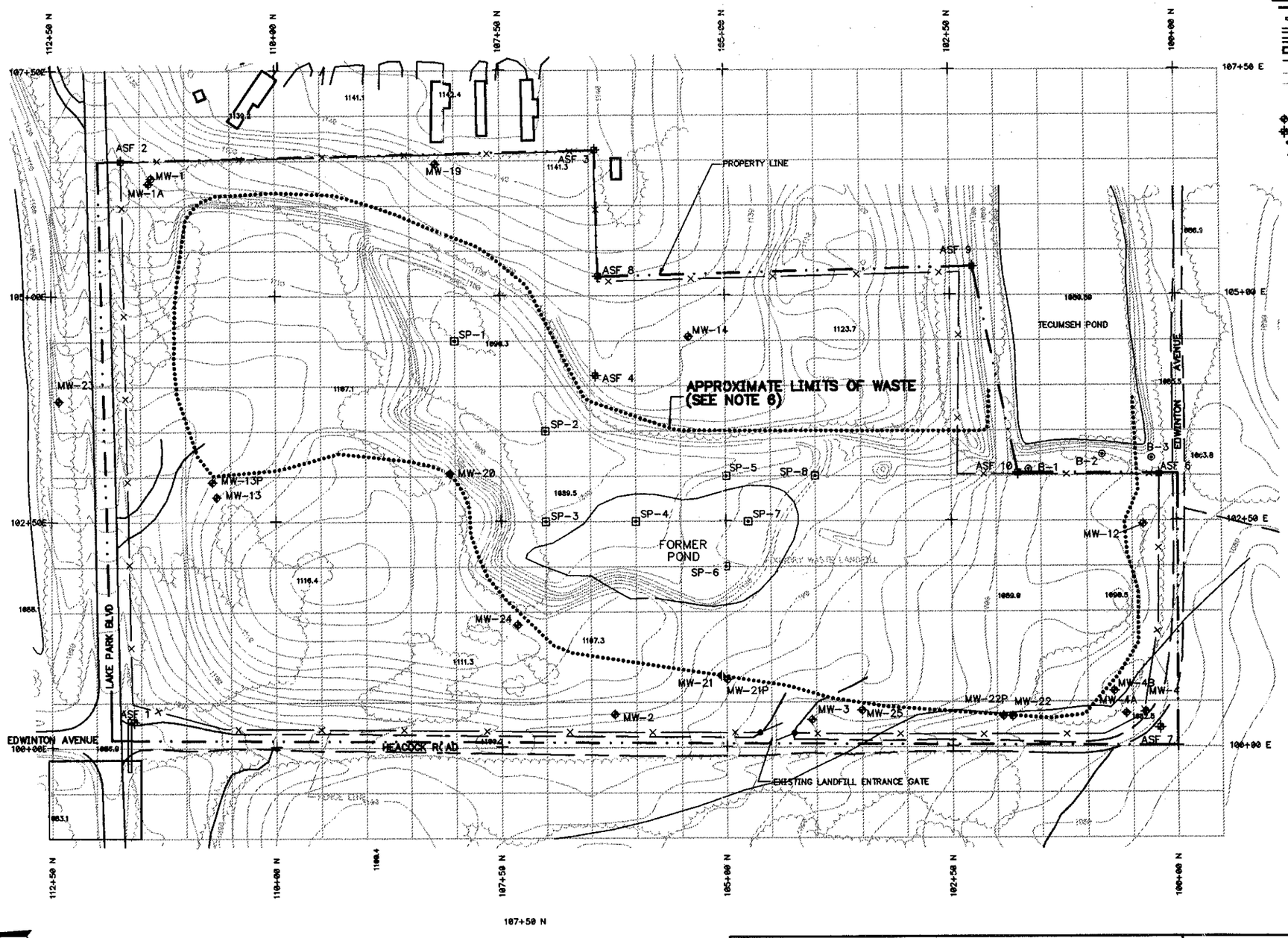
Gregory S. Kinsall, P.G.
Senior Project Geologist

Gary J. Deigan /slr

Gary J. Deigan
Principal Project Manager

GSK:GJD/slr
Attachments

cc: Pat Petrella



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1060.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 15, 1985 WITH ADDITIONAL SURVEY CONDUCTED IN JUNE 1988.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM KBM INC. OF GRAND FORKS, ND DATE OF PHOTOGRAPHY NOV. 17, 1991.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF 10000N, 10000E.
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE		
MONUMENT NO.	NORTHING	EASTING
ASF 1	11158.33	10027.57
ASF 2	11172.05	10648.06
ASF 3	10643.49	10058.61
ASF 4	10637.39	10488.67
ASF 5	10017.8	10301.5
ASF 7	10020.0	10020.0
ASF 8	10548.20	10526.52
ASF 9	10224.68	10531.12
ASF 10	10175.10	10382.64

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURNSTEIN MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISED PRIOR TO CONSTRUCTION.

SOURCE MAP:
RMT, INC.

N

0 125'
SCALE

TAD-12/13/95-10:24-J:\CAD93\100\19795

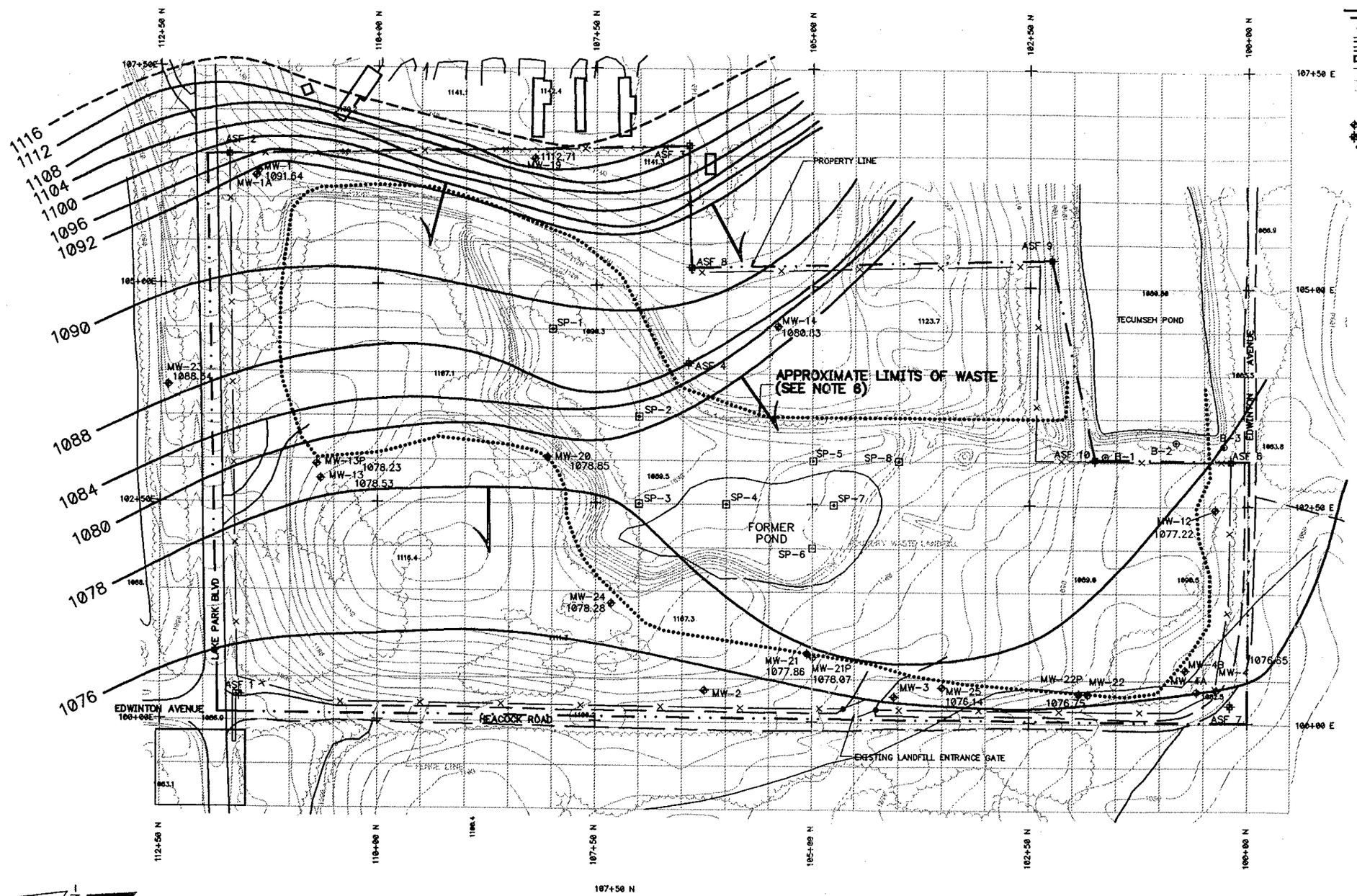
FIGURE 1

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

MONITORING NETWORK LAYOUT

SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1060.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 15, 1988 WITH ADDITIONAL SURVEY CONDUCTED IN JUNE 1988.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM KBM INC. OF GRAND FORKS, ND DATE OF PHOTOGRAPHY NOV. 17, 1991.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF 10000N, 10000E.
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE

MONUMENT NO.	NORTHING	EASTING
ASF 1	11150.33	10027.57
ASF 2	11172.05	10048.05
ASF 3	10943.40	10050.01
ASF 4	10637.30	10400.67
ASF 6	10017.8	10301.5
ASF 7	10020.0	10020.0
ASF 8	10040.20	10020.52
ASF 9	10224.69	10031.12
ASF 10	10175.19	10302.04

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURKSTEIN MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISED PRIOR TO CONSTRUCTION.

SOURCE MAP:
RMT, INC.

N

0 125'
SCALE

JIM-11/09/95-11:55-J:\CAD93\100\19795

FIGURE 2

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

GROUNDWATER FLOW MAP (SEPTEMBER 1995)

SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

Table 1

Groundwater Monitoring Network
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Wells Screened in Bedrock	
Well I.D.	Well Position
MW-1A	Upgradient
MW-14	Upgradient
MW-19	Upgradient
MW-13P	Downgradient
MW-20	Downgradient
MW-21P	Downgradient
MW-22P	Downgradient
MW-24	Downgradient

Wells Screened in Mine Spoils	
Well I.D.	Well Position
MW-23	Upgradient
MW-4B	Downgradient
MW-12	Downgradient
MW-13	Downgradient
MW-21	Downgradient
MW-22	Downgradient
MW-25	Downgradient

Table 2

Sampling and Analysis Program
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Parameter	Sampling Frequency
Arsenic	Semiannually
Barium	Semiannually
Cadmium	Semiannually
Chromium	Semiannually
Cobalt	Semiannually
Fluoride	Semiannually
Iron	Semiannually
Lead	Semiannually
Manganese	Semiannually
Mercury	Semiannually
Nickel	Semiannually
Selenium	Seminannually
Silver	Semiannually
Zinc	Semiannually
Chloride	Semiannually
Sulfate	Semiannually
Total phenolics	Semiannually
pH*	Semiannually
Specific Conductance*	Semiannaully

*Field measured.

Table 3

Summary of Groundwater Sample Analytical Results September 1995 American Steel Foundries Sebring Landfill Alliance, Ohio

Parameter	MW-1A	MW-4B	MW-12	MW-13P	MW-13 DUP	MW-14	MW-19	MW-20	MW-21	MW-21DP
Arsenic	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0023
Barium	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.069	0.065
Cadmium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Cobalt	0.03	0.02 U	0.02 U	0.17	0.17	0.02 U	0.02 U	0.02 U	0.02	0.02 U
Fluoride	1.3 U	0.26	0.58	0.40	0.53	0.33	0.10 U	0.47	2.9	2.9
Iron	24.1	10.4	14.0	13.5	14.0	1.9	0.03 U	24.1	0.19	0.22
Lead	0.0002 U	0.002 U	0.002 J	0.002 UJ	0.002 UJ	0.01 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Manganese	2.4	5.0	45.0	17.0	17.1	0.57	0.74	10.3	0.074	0.072
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Nickel	0.09	0.02 U	0.02 U	0.22	0.23	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Selenium	0.002 UJ	0.002 U	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Silver	0.01 U	0.01 U	0.010 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Zinc	0.018	0.035	0.01 U	0.35	0.36	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloride	262 J	31.9 J	32.3 J	116.0 J	118.0 J	25.5 J	3.7 J	41.9 J	40.6 J	43.0 J
Sulfate	597	453	389	590	574	1,070	47.1	775	466	432
Total phenolics	0.012	0.007	0.0069	0.0078	0.005 U	0.0092	0.005 U	0.016	0.016	0.005 U
pH	5.8	7.9	7.4	5.3	NC	6.6	6.8	7.5	7.0	NC
Specific conductance	12,780	13,330	7,250	10,310	NC	15,200	7,110	13,190	12,390	NC

Table 3

Summary of Groundwater Sample Analytical Results September 1995 American Steel Foundries Sebring Landfill Alliance, Ohio (Continued)

Parameter	MW-21 P	MW-22	MW-22 P	MW-23	MW-24	MW-25
Arsenic	0.006	0.002	0.002 U	0.002 U	0.002 U	0.003
Barium	0.05 U	0.05 U	0.096	0.05 U	0.05 U	0.05 U
Cadmium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Cobalt	0.02 U	0.02 U	0.02 U	0.02	0.43	0.031
Fluoride	0.66	0.62	1.1	0.16	0.14	0.40
Iron	36.0	15.2	0.03 U	5.1	85.3	17.5
Lead	0.002 UJ	0.002 UJ	0.002 U	0.002 UJ	0.002 UJ	0.002 UJ
Manganese	9.8	5.0	0.014	3.9	80.4	6.7
Mercury	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
Nickel	0.02 U	0.02 U	0.02 U	0.024	0.23	0.02 U
Selenium	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ	0.002 UJ
Silver	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Zinc	0.011	0.019	0.01 U	0.045	0.22	0.024
Chloride	50.6 J	38.3 J	54.8 J	214 J	24.3	46.7 J
Sulfate	1,360	473	364	249	2,510	1,180
Total phenolics	0.0073	0.0074	0.014	0.005 U	0.0062	0.011
pH	7.3	6.7	7.6	7.2	7.4	6.8
Specific conductance	11,440	8,090	16,120	6,990	7,110	3,040

0.01 U - Undetected at a detection limit of 0.01 mg/L.
NC - Not collected.
Analytical results reported as mg/L.
pH reported as standard units (S.U.).
Specific conductance reported as umhos/cm.

Table 4

Summary of Upper Tolerance Levels
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Parameter	Bedrock Monitoring Wells (mg/L)	Mine Spoils Monitoring Wells (mg/L)
Arsenic	0.006	0.006
Barium	0.10	0.10
Cadmium	0.0036	0.012
Cobalt	0.048	0.10
Chromium	0.03	0.004
Fluoride	1.65	0.326
Iron	36.6	24.0
Lead	0.006	0.006
Manganese	3.1	6.63
Mercury	0.0004	0.0004
Nickel	0.095	0.080
Selenium	0.08	0.006
Silver	0.002	0.002
Zinc	0.2	0.137
Chloride	349.45	411.1
Sulfate	13,886.5	1,741.2
Total phenolics	0.26	
pH*	0.96/10.1	4.61/8.35
Specific conductance**	3,072	2,135

NA - Not applicable.
* - pH has lower/upper tolerance levels, reported in standard units (S.U.).
** - Specific conductance is reported in μmhos/cm.

Table 5

Summary of Analytical Results Exceeding Upper Tolerance Levels — Bedrock Wells
September 1995
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Parameter	Upper Tolerance Level (mg/L)	MW-13P (mg/L)	MW-19 (mg/L)	MW-20 (mg/L)	MW-21P (mg/L)	MW-22P (mg/L)	MW-24 (mg/L)
Cobalt	0.048	0.17					0.43
Fluoride	1.65				9.8	3.9	
Iron	24.0						85.3
Manganese	3.1	17.1		10.3			80.4
Nickel	0.095	0.22					0.23
Zinc	0.2	0.35					0.22
Specific Conductance*	3,072	10,300	7,200	13,190	11,440	16,120	7,110

* Specific conductance reported in μmhos/cm.

Table 6

Summary of Analytical Results Exceeding Upper Tolerance Levels — Mine Spoils Wells September 1995 American Steel Foundries Sebring Landfill Alliance, Ohio

Parameter	Upper Tolerance Level (mg/L)	MW-01A (mg/L)	MW-4B (mg/L)	MW-14 (mg/L)	MW-21 (mg/L)	MW-21DP (mg/L)	MW-23 (mg/L)	MW-25 (mg/L)
Iron	0.10	24.1						
Manganese	6.63							6.7
Nickel	0.08	0.09						
Zinc	0.137	0.18						
Fluoride	0.326	1.3		0.33	2.9	2.9	2.9	0.4
Specific Conductance*	2,135	12,700	13,300	15,200	12,390	NC	6,990	3,040

* Specific conductance reported in µmhos/cm.

NC - Not collected.

Table 7

Groundwater Elevation Data
September 1995
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Well I.D.	Top of Casing Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
MW-1A	1,126.09	34.45	1,091.64
MW-4B	1,085.76	9.11	1,076.65
MW-12	1,087.94	10.72	1,077.22
MW-13	1,107.70	29.17	1,078.53
MW-13P	1,106.80	28.57	1,078.23
MW-14	1,131.18	50.35	1,080.83
MW-19	1,141.16	28.45	1,112.71
MW-20	1,113.21	34.36	1,078.85
MW-21	1,101.12	23.26	1,077.86
MW-21P	1,101.12	23.05	1,078.07
MW-22	1,091.01	14.26	1,076.75
MW-22P	1,091.23	20.60	1,070.63
MW-23	1,107.81	19.47	1,088.34
MW-24	1,110.96	32.68	1,078.28
MW-25	1,095.39	19.25	1,076.14

Note: Water level measurements were conducted on September 19, 1995, prior to groundwater sampling.
MSL= Mean Sea Level
ft = feet

ATTACHMENT A

ANALYTICAL DATA

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
708-534-5200 • Fax 708-534-5211

October 23, 1995

JGK 10/30/95

Mr. Greg Kinsall
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Work Order No. 10752-005-001-9999

RE: American Steel Foundries
RFW Lot 9509G227

Dear Mr. Kinsall:

Enclosed is the Analytical Report for the Project and RFW Lot Number listed above. If you have any questions, please contact me at (708) 534-5200.

Very truly yours,
Weston Environmental Metrics, Inc.

Jane D. Huber
Project Manager

jb

Enclosures

Approved By:

Sheryl Johnson for
Michael J. Healy
Vice President/Laboratory Manager

The results in this report relate only to the analytical testing and condition of samples at receipt. This report pertains to only those samples actually tested. All 63 pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

CLIENT/SUBJECT American Steel Foundries W.O. NO.

TASK DESCRIPTION Lab Batch #9509G227 TASK NO.

PREPARED BY Linda Korobka DEPT DATE 10/20/95

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

Inorganics: Wet Chemistry; Chloride; Fluoride; Total Phenolics; Sulfate

1. Samples	Lab ID	Matrix	Date Collected	Date Prep	Date Analyzed
MW-01A	001	water	9/20/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-04B	002	water	9/19/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-12	003	water	9/19/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-13P	004	water	9/20/95	9/26; 9/29; 10/4; 10/20	9/27; 9/29; 10/4; 10/20
MW-14	005	water	9/20/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-19	006	water	9/20/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-20	007	water	9/20/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-21	008	water	9/20/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-21P	009	water	9/20/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-22	010	water	9/19/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-22P	011	water	9/19/95	9/26; 9/28; 9/29; 10/4	9/27; 9/28; 9/29; 10/4
MW-23	012	water	9/19/95	9/26; 9/28; 9/29; 10/10	9/27; 9/28; 9/29; 10/10
MW-24	013	water	9/20/95	9/26; 9/28; 9/29; 10/10	9/27; 9/28; 9/29; 10/10
MW-25	014	water	9/19/95	9/26; 9/28; 9/29; 10/10	9/27; 9/28; 9/29; 10/10
MW-21 DUP	015	water	9/20/95	9/26; 9/28; 9/29; 10/10	9/27; 9/28; 9/29; 10/10
MW-13 DUP	016	water	9/20/95	9/26; 9/29; 10/10; 10/20	9/27; 9/29; 10/10; 10/20
FB-01	017	water	9/20/95	9/26; 9/28; 9/29; 10/10	9/27; 9/28; 9/29; 10/10

2. Holding Times

Samples MW-13P and MW-13 DUP were analyzed two days past holding time for chloride. Therefore, the chloride results in samples MW-13P and MW-13 DUP were qualified as estimated (J).

3. Blanks

The method blanks associated with these samples were free of contamination.

4. Duplicates

All duplicate results were acceptable.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

CLIENT/SUBJECT American Steel Foundries W.O. NO.

TASK DESCRIPTION Lab Batch # 9509G227 TASK NO.

PREPARED BY Linda Korobka DEPT DATE 10/30/95

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

Inorganics: Soluble Metals (Continued)

2. Holding Times
All samples were prepared and analyzed within the required holding times.

3. Blanks
The method blank associated with these samples was free of contamination.

4. Duplicates
All duplicate results were acceptable.

5. Matrix Spike
The soluble lead (71.6%) and soluble selenium (72.2%) matrix spike recoveries were outside the QC limits. Therefore, all soluble lead and soluble selenium results were qualified as estimated (J).

6. Laboratory Control Standards
The laboratory control standard results were acceptable.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

CLIENT/SUBJECT American Steel Foundries W.O. NO.

TASK DESCRIPTION Lab Batch #9509G227 TASK NO.

PREPARED BY Linda Krobka DEPT DATE 10/30/95

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

Inorganics: Wet Chemistry (Continued)

5. Matrix Spike

The chloride matrix spike recovery (132%) was outside the QC limits. Therefore, all chloride results except sample FB-01 were qualified as estimated (J).

6. Laboratory Control Standards

All laboratory control standard results were acceptable.

Inorganic: Soluble Metals

1. Samples	Lab ID	Matrix	Date Collected	Date Prep	Date Analyzed
MW-01A	001	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-04B	002	water	9/19/95	9/22; 9/25	9/22; 9/25; 9/26
MW-12	003	water	9/19/95	9/22; 9/25	9/22; 9/25; 9/26
MW-13P	004	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-14	005	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-19	006	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-20	007	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-21	008	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-21P	009	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-22	010	water	9/19/95	9/22; 9/25	9/22; 9/25; 9/26
MW-22P	011	water	9/19/95	9/22; 9/25	9/22; 9/25; 9/26
MW-23	012	water	9/19/95	9/22; 9/25	9/22; 9/25; 9/26
MW-24	013	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-25	014	water	9/19/95	9/22; 9/25	9/22; 9/25; 9/26
MW-21 DUP	015	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
MW-13 DUP	016	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26
FB-01	017	water	9/20/95	9/22; 9/25	9/22; 9/25; 9/26

GLOSSARY OF DATA QUALIFIERS AND ABBREVIATIONS

Data Qualifiers

B	Compound was found in the blank and the sample
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis
E	Concentration exceeds the instrument calibration range and was subsequently diluted
I	Appears on the "results spreadsheet" to indicate an interference
J	Result is an estimated value below the reporting limit or a tentatively identified compound (TIC)
T	Compound was found in the TCLP extraction blank and the sample
U	Analyte was not detected at or above the reporting limit
X	Result obtained indirectly through calculation based on results from other analyses

Abbreviations

Batch	Designation given to identify a specific extraction, digestion or preparation set (equivalent to prep batch)
BS	Blank spike analysis was conducted on reagent grade water or a matrix free from the analyte of interest
BSD	Blank spike duplicate
BRL	Below reporting limit
CD	Calculation factor used by the Laboratory's Information Management System (LIMS)
Contract	Contract laboratory identification code
DF	Dilution factor
DL	Appears in the sample ID to indicate a secondary dilution was performed
LCS/LC	Denotes laboratory control standard
LAB ID	Tne full 12 character Weston laboratory identification number (equivalent to RFW#)
MB	Method blank or (PB) preparation blank
MS	Matrix spike
MSD	Matrix spike duplicate
NA	Not applicable
NC	Non-calculable precision due to insufficient concentration of analyte present in the sample
NR	Not required
NS	Not spiked
RE	Appears in the sample ID to indicate a re-analysis
REP	Replicate analysis
Reprep	Sample was reprepared and then reanalyzed
RFW#	The full 12 character WESTON laboratory identification number (equivalent to LAB ID)
RFW Lot	The first 8 characters of the RFW#
RPD	Relative percent difference of duplicate analyses
RRF	Relative response factor
RT	Retention time
RTW	Retention time widow
SP	Blank spike, blank spike duplicate, matrix spike or matrix spike duplicate
WO#	Work order no. WESTON code used to define a specific client, job, phase and task

NOTES:

- One or a combination of these data qualifiers and abbreviations may appear in the analytical report.
- Soil, sediment and sludge results are reported on a dry weight basis except when analyzed for landfill disposal or incineration parameters. All other results on a solid matrix are reported on an "as received" basis unless noted differently.
- Reporting limits are adjusted for preparation sample size, sample dilutions and sample moisture content if analyzed on a dry weight basis.

Revised 12/09/94

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-01A							
CHLORIDE	001	W	95GHA105	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	001	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	001	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	001	W	95GSA101	09/20/95	09/21/95	09/29/95	09/29/95
MW-04B							
CHLORIDE	002	W	95GHA105	09/19/95	09/21/95	09/28/95	09/28/95
FLUORIDE	002	W	95GFL069	09/19/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	002	W	95GPE046	09/19/95	09/21/95	09/26/95	09/27/95
SULFATE	002	W	95GSA101	09/19/95	09/21/95	09/29/95	09/29/95
MW-12							
CHLORIDE	003	W	95GHA105	09/19/95	09/21/95	09/28/95	09/28/95
FLUORIDE	003	W	95GFL069	09/19/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	003	W	95GPE046	09/19/95	09/21/95	09/26/95	09/27/95
SULFATE	003	W	95GSA101	09/19/95	09/21/95	09/29/95	09/29/95
MW-13P							
CHLORIDE	004	W	95GHA117	09/20/95	09/21/95	10/20/95	10/20/95
FLUORIDE	004	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	004	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	004	W	95GSA101	09/20/95	09/21/95	09/29/95	09/29/95
MW-14							
CHLORIDE	005	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
CHLORIDE	005 REP	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
CHLORIDE	005 MS	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
CHLORIDE	005 MSD	W	95GHA107	09/20/95	09/21/95	10/04/95	10/04/95
FLUORIDE	005	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
FLUORIDE	005 REP	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
FLUORIDE	005 MS	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	005	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
PHENOLICS	005 REP	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
PHENOLICS	005 MS	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	005	W	95GSA101	09/20/95	09/21/95	09/29/95	09/29/95
SULFATE	005 REP	W	95GSA101	09/20/95	09/21/95	09/29/95	09/29/95
SULFATE	005 MS	W	95GSA101	09/20/95	09/21/95	09/29/95	09/29/95
MW-19							
CHLORIDE	006	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	006	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	006	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	006	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95
MW-20							
CHLORIDE	007	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	007	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	007	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	007	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95
MW-21							
CHLORIDE	008	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	008	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	008	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	008	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95
MW-21P							
CHLORIDE	009	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	009	W	95GFL069	09/20/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	009	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	009	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95
MW-22							
CHLORIDE	010	W	95GHA106	09/19/95	09/21/95	09/28/95	09/28/95
FLUORIDE	010	W	95GFL069	09/19/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	010	W	95GPE046	09/19/95	09/21/95	09/26/95	09/27/95
SULFATE	010	W	95GSA102	09/19/95	09/21/95	09/29/95	09/29/95

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-22P							
CHLORIDE	011	W	95GHA106	09/19/95	09/21/95	09/28/95	09/28/95
FLUORIDE	011	W	95GFL069	09/19/95	09/21/95	10/04/95	10/04/95
TOTAL PHENOLICS	011	W	95GPE046	09/19/95	09/21/95	09/26/95	09/27/95
SULFATE	011	W	95GSA102	09/19/95	09/21/95	09/29/95	09/29/95
MW-23							
CHLORIDE	012	W	95GHA106	09/19/95	09/21/95	09/28/95	09/28/95
FLUORIDE	012	W	95GFL070	09/19/95	09/21/95	10/10/95	10/10/95
TOTAL PHENOLICS	012	W	95GPE046	09/19/95	09/21/95	09/26/95	09/27/95
SULFATE	012	W	95GSA102	09/19/95	09/21/95	09/29/95	09/29/95
SULFATE	012 REP	W	95GSA102	09/19/95	09/21/95	09/29/95	09/29/95
SULFATE	012 MS	W	95GSA102	09/19/95	09/21/95	09/29/95	09/29/95
MW-24							
CHLORIDE	013	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	013	W	95GFL070	09/20/95	09/21/95	10/10/95	10/10/95
TOTAL PHENOLICS	013	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	013	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95
MW-25							
CHLORIDE	014	W	95GHA106	09/19/95	09/21/95	09/28/95	09/28/95
FLUORIDE	014	W	95GFL070	09/19/95	09/21/95	10/10/95	10/10/95
TOTAL PHENOLICS	014	W	95GPE046	09/19/95	09/21/95	09/26/95	09/27/95
SULFATE	014	W	95GSA102	09/19/95	09/21/95	09/29/95	09/29/95
MW-21 DUP							
CHLORIDE	015	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	015	W	95GFL070	09/20/95	09/21/95	10/10/95	10/10/95
TOTAL PHENOLICS	015	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	015	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-13 DUP							
CHLORIDE	016	W	95GHA117	09/20/95	09/21/95	10/20/95	10/20/95
FLUORIDE	016	W	95GFL070	09/20/95	09/21/95	10/10/95	10/10/95
TOTAL PHENOLICS	016	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	016	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95
FB-01							
CHLORIDE	017	W	95GHA106	09/20/95	09/21/95	09/28/95	09/28/95
FLUORIDE	017	W	95GFL070	09/20/95	09/21/95	10/10/95	10/10/95
TOTAL PHENOLICS	017	W	95GPE046	09/20/95	09/21/95	09/26/95	09/27/95
SULFATE	017	W	95GSA102	09/20/95	09/21/95	09/29/95	09/29/95

LAB QC:

CHLORIDE	LCS BS	W	95GHA105	N/A	N/A	09/28/95	09/28/95
CHLORIDE	LCS BSD	W	95GHA105	N/A	N/A	09/28/95	09/28/95
CHLORIDE	MB1	W	95GHA105	N/A	N/A	09/28/95	09/28/95
FLUORIDE	LCS BS	W	95GFL069	N/A	N/A	10/04/95	10/04/95
FLUORIDE	LCS BSD	W	95GFL069	N/A	N/A	10/04/95	10/04/95
FLUORIDE	MB1	W	95GFL069	N/A	N/A	10/04/95	10/04/95
PHENOLICS	LCS BS	W	95GPE046	N/A	N/A	09/26/95	09/27/95
PHENOLICS	LCS BSD	W	95GPE046	N/A	N/A	09/26/95	09/27/95
TOTAL PHENOLICS	MB1	W	95GPE046	N/A	N/A	09/26/95	09/27/95
SULFATE	LCS BS	W	95GSA101	N/A	N/A	09/29/95	09/29/95
SULFATE	LCS BSD	W	95GSA101	N/A	N/A	09/29/95	09/29/95
SULFATE	MB1	W	95GSA101	N/A	N/A	09/29/95	09/29/95
CHLORIDE	LCS BS	W	95GHA117	N/A	N/A	10/20/95	10/20/95
CHLORIDE	LCS BSD	W	95GHA117	N/A	N/A	10/20/95	10/20/95
CHLORIDE	MB1	W	95GHA117	N/A	N/A	10/20/95	10/20/95
CHLORIDE	LCS BS	W	95GHA106	N/A	N/A	09/28/95	09/28/95
CHLORIDE	LCS BSD	W	95GHA106	N/A	N/A	09/28/95	09/28/95
CHLORIDE	MB1	W	95GHA106	N/A	N/A	09/28/95	09/28/95
CHLORIDE	LCS BS	W	95GHA107	N/A	N/A	10/04/95	10/04/95
CHLORIDE	LCS BSD	W	95GHA107	N/A	N/A	10/04/95	10/04/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
CHLORIDE	MB1	W	95GHA107	N/A	N/A	10/04/95	10/04/95
SULFATE	LCS BS	W	95GSA102	N/A	N/A	09/29/95	09/29/95
SULFATE	LCS BSD	W	95GSA102	N/A	N/A	09/29/95	09/29/95
SULFATE	MB1	W	95GSA102	N/A	N/A	09/29/95	09/29/95
FLUORIDE	LCS BS	W	95GFL070	N/A	N/A	10/10/95	10/10/95
FLUORIDE	LCS BSD	W	95GFL070	N/A	N/A	10/10/95	10/10/95
FLUORIDE	MB1	W	95GFL070	N/A	N/A	10/10/95	10/10/95

SIGNATURE Diane L. Hanson DATE 10/23/95

NY CERTIFICATION # 11006

ROY F. WESTON, INC.
ENVIRONMENTAL METRICS, INC.
WET CHEMISTRY CASE NARRATIVE

Client: American Steel
RFW #: 9509G227 Date Rec'd: 09/21/95

Please note that the analysis for phenol of field duplicates identified at the laboratory as 9509G227-008 and 9509G227-015 resulted in poor reproducibility with results of 0.016 mg/L and <0.005 mg/L. The analysis was repeated for both samples with similar disparity between the values, but with the higher result from the opposite field container. This indicates sample non-homogeneity. All in-lab QC was within acceptance limits.

Diane L. Harper
Wet Chemistry Section Manager

10/23/95
Date

Environmental Metrics, Inc. Method Reference

The following methods are used as reference for the analysis of samples contained within this RFW Lot:

WET CHEMISTRY METHODS

% Ash	___ SM 2540G	Cyanide, Amenable	___ EPA 335.1
	___ ASTM D3174		___ SW846 9010A
	___ ASTM D482		___ SM 4500-CNG
% Water Karl Fisher	___ ASTM D4377-84	Cyanide, Free	_____
% Water Dean Stark	___ ASTM D95-83	Cyanide, Reactive	___ SW846 7.3.3.2
% Moisture	___ SM 2540G	Cyanide, Total	___ EPA 335.2
% Solids	___ SM 2540G		___ SW846 9010A
% Volatiles	___ SM 2540 G		___ SM 4500-CNC
Acidity	___ EPA 305.1		___ ILM03.0
	___ SM 2310B	Density/Specific Gravity	___ SM 2710F
Alkalinity	___ EPA 310.1		___ ASTM D1298
	___ SM 2320B	Extractable Organic Halogens	___ Dohrmann Meth.
Ammonia (Dist/Nesslers)	___ EPA 350.2	Flashpoint	___ SW846 1010
	___ SM4500-NH_3C		___ ASTM D93
Biochemical Oxygen Demand	___ EPA 405.1		___ ASTM D92
	___ SM 5210B	Fluoride	✓ EPA 340.2
Bottom Sediment & Water	___ ASTM D4007		___ SM 4500 FC
BTU	___ ASTM D240	Fluorine	___ ASTM 3761 Mod
Bromide	___ EPA 320.1	Hardness	___ SM 2340 B
Bromine	___ EPA 320.1 after bomb	Heavy Metals	___ USP 231
Chemical Oxygen Demand High	___ HACH 8000	Ignitability	___ SW846 Section 7
Chemical Oxygen Demand Low	___ HACH 8000	Iodide (Tritrimetric)	___ EPA 345.1
Chloride	✓ EPA 325.2	MBAS (Surfactants)	___ EPA 425.1
	___ SW846 9251		___ SM 5540 C
	___ SM 4500 Cl^-E	Nitrate/Nitrite	___ EPA 353.2
Chlorine (O_2Bomb)	___ ASTM D808 Mod		___ SM 4500 NO_3^-F
Chlorine, Residual	___ EPA 330.4	Nitrate	___ EPA 353.2
	___ SM 4500 ClC		___ SM 4500 NO_3^-F
Chromium VI	___ SM 3500 CrD	Nitrite	___ EPA 354.1
	___ SW846 7196		___ SM 4500 NO_2^-B
Color	___ EPA 110.2	Odor	___ EPA 140.1
	___ SM 2120B		___ SM 2150B
Corrosivity, pH	___ EPA 150.1	Oil & Grease, Gravimetric	___ EPA 413.1
	___ SW846 9040		___ SM 5520B
	___ SW846 9045		___ SW846 9070
Corrosivity, Langlier	___ SM 2330A+B	Oil & Grease, IR	___ EPA 413.2
			___ SM 5520C

WET CHEMISTRY METHODS

Oil & Grease, Soxhlet	___ SW846 9071
	___ SM 5520D
Oxygen, Dissolved	___ EPA 360.1
Paint Fliters (Free Liquid)	___ SW 846 9095
Petroleum Hydrocarbons	___ EPA 418.1
pH, Water	___ SW 9041A
	___ EPA 150.1
	___ SM 4500 H^+B
	___ SW846 9040A
pH Soil	___ SW846 9045
Phenol	✓ EPA 420.2
	___ SW846 9066
Orthophosphate as P	___ EPA 365.2
	___ SM 4500PE
Phosphorus, as P	___ EPA 365.2
	___ EPA 365.4
	___ SM 4500PE
ROE at 180 C	___ EPA 160.1, mod
	___ SM 2540C, mod
Settleable Solid	___ EPA 160.5
	___ SM 2540F
Soluble Organic Carbon	___ EPA 415.1
	___ SM 5310C
Specific Conductance	___ EPA 120.1
	___ SM 2510B
Sulfate (Turbidimetric)	✓ EPA 375.4
	___ SW846 9038
	___ SM 4500-SO_4^2E
Sulfide (Tritrimetric)	___ EPA 376.1
	___ SM 4500-S^2E
	___ SW846 9030A, mod
Sulfide, Reactive	___ SW846 7.3.4.2
Sulfite	___ EPA 377.1
	___ SM 4500-SO_3^2B

Sulfur	___ ASTM 129
	___ EPA 375.4
	(SO_4) after bombing
Total Disolved Solids	___ EPA 160.1
	___ SM2540C
Total Inorganic Carbon	___ EPA 415.1
	___ SM 5310C
Total Kjeldahl Nitrogen	___ EPA 351.3
	___ SM 4500N_{org}C
Total Organic Carbon	___ EPA 415.1
	___ SM 5310C
	___ SW846 9060 Quads
Total Organic Halogens	___ SW846 9020A
	___ SM 5320B
Total Org Halogens on Waste	___ ASTM D808
	and EPA 325.3
Total Solids	___ EPA 160.3
	___ SM 2540B
Total Suspended Solids	___ EPA 160.2
	___ SM 2540D
Total Volatile Solids	___ EPA 160.4
	___ SM2540E
Turbidity	___ EPA 180.1
	___ SM 2130B
Viscosity, Brookfield	___ ASTM D2983
Viscosity, Kinematic	___ ASTM D445
Volatile Dissolved Solids	___ EPA 160.4
	___ SM 2540E
Volatile Suspended Solids	___ EPA 160.4
	___ SM 2540E

_____
_____
_____
_____

Microbiological

Heterotrophic Plate Count	___ SM 907A
Fecal Coliform	___ SM 909C
Total Coliform	___ SM 909A
MPN	___ SM 908

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-01A
Project # 10752-005-001-9999
Lab ID: 9509G227-001
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	262 J	mg/L	20.0
Fluoride	1.3	mg/L	0.10
Total Phenolics	0.012	mg/L	0.0050
Sulfate	597	mg/L	100

L. Korobka
10/30/95

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Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-04B
Project # 10752-005-001-9999
Lab ID: 9509G227-002
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	31.9 J	mg/L	4.0
Fluoride	0.26	mg/L	0.10
Total Phenolics	0.0070	mg/L	0.0050
Sulfate	453	mg/L	100

L. Korobka
10/30/95

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2417 Bond Street
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To: American Steel Foundries
Roy F. Weston, Incorporated
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Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-12
Project # 10752-005-001-9999
Lab ID: 9509G227-003
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	32.3 J	mg/L	4.0
Fluoride	0.58	mg/L	0.10
Total Phenolics	0.0069	mg/L	0.0050
Sulfate	389	mg/L	100

L. Krobka
10/30/95

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Roy F. Weston, Incorporated
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Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-13P
Project # 10752-005-001-9999
Lab ID: 9509G227-004
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	116 J	mg/L	10.0
Fluoride	0.40	mg/L	0.10
Total Phenolics	0.0078	mg/L	0.0050
Sulfate	590	mg/L	100

L. Korobka
10/30/95

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Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-14
Project # 10752-005-001-9999
Lab ID: 9509G227-005
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	25.5 J	mg/L	2.0
Fluoride	0.33	mg/L	0.10
Total Phenolics	0.0092	mg/L	0.0050
Sulfate	1070	mg/L	250

L. Korobka 10/30/95

Weston Environmental Metrics, Inc.
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-19
Project # 10752-005-001-9999
Lab ID: 9509G227-006
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	3.7 J	mg/L	2.0
Fluoride	0.10 u	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050
Sulfate	47.1	mg/L	10.0

L. Krobka
10/30/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
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3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-20
Project # 10752-005-001-9999
Lab ID: 9509G227-007
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	41.9 J	mg/L	10.0
Fluoride	0.47	mg/L	0.10
Total Phenolics	0.016	mg/L	0.0050
Sulfate	775	mg/L	100

L. Kaabra 10/30/95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-21
Project # 10752-005-001-9999
Lab ID: 9509G227-008
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	40.6 J	mg/L	10.0
Fluoride	2.9	mg/L	0.20
Total Phenolics	0.016	mg/L	0.0050
Sulfate	466	mg/L	100

L. Korobka
10/30/95

Weston Environmental Metrics, Inc.
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Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-21P
Project # 10752-005-001-9999
Lab ID: 9509G227-009
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	50.6 J	mg/L	10.0
Fluoride	0.66	mg/L	0.10
Total Phenolics	0.0073	mg/L	0.0050
Sulfate	1360	mg/L	250

L. Korolka
10/30/95

Weston Environmental Metrics, Inc.
2417 Bond Street
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Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-22
Project # 10752-005-001-9999
Lab ID: 9509G227-010
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	38.3 J	mg/L	10.0
Fluoride	0.62	mg/L	0.10
Total Phenolics	0.0074	mg/L	0.0050
Sulfate	473	mg/L	100

L. Korbka
10/30/95

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Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-22P
Project # 10752-005-001-9999
Lab ID: 9509G227-011
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	54.8 J	mg/L	10.0
Fluoride	1.1	mg/L	0.10
Total Phenolics	0.014	mg/L	0.0050
Sulfate	364	mg/L	100

L. Korobka 10/30/95

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Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-23
Project # 10752-005-001-9999
Lab ID: 9509G227-012
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	214 J	mg/L	50.0
Fluoride	0.16	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050
Sulfate	249	mg/L	50.0

L. Korobka
10/30/95

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Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-24
Project # 10752-005-001-9999
Lab ID: 9509G227-013
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	24.3 J	mg/L	2.0
Fluoride	0.14	mg/L	0.10
Total Phenolics	0.0062	mg/L	0.0050
Sulfate	2510	mg/L	500

L. Korobka
10/30/95

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Roy F. Weston, Incorporated
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Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-25
Project # 10752-005-001-9999
Lab ID: 9509G227-014
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	46.7 J	mg/L	10.0
Fluoride	0.40	mg/L	0.10
Total Phenolics	0.011	mg/L	0.0050
Sulfate	1180	mg/L	400

L. Korobka
10/30/95

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3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-13 DUP
Project # 10752-005-001-9999
Lab ID: 9509G227-016
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	118 J	mg/L	10.0
Fluoride	0.53	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050
Sulfate	574	mg/L	100

L. Krolka
10/30/95

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Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: MW-21 DUP
Project # 10752-005-001-9999
Lab ID: 9509G227-015
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Chloride	43.0 J	mg/L	10.0
Fluoride	2.9	mg/L	0.20
Total Phenolics	0.0050 u	mg/L	0.0050
Sulfate	432	mg/L	100

L. Korocka
10/30/95

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To: American Steel Foundries
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Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

RE: FB-01
Project # 10752-005-001-9999
Lab ID: 9509G227-017
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Chloride	2.0	u	mg/L	2.0
Fluoride	0.10	u	mg/L	0.10
Total Phenolics	0.0050	u	mg/L	0.0050
Sulfate	5.0	u	mg/L	5.0

L. Cordova
10/30/95

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Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Method Blank Data Report

Sample	Lab ID	Parameter	Result		Units	Reporting Limit
Blank 1	95GHA105-MB1	Chloride	2.0	u	mg/L	2.0
Blank 1	95GFL069-MB1	Fluoride	0.10	u	mg/L	0.10
Blank 1	95GPE046-MB1	Total Phenolics	0.0050	u	mg/L	0.0050
Blank 1	95GSA101-MB1	Sulfate	5.0	u	mg/L	5.0
Blank 1	95GHA117-MB1	Chloride	2.0	u	mg/L	2.0
Blank 1	95GHA106-MB1	Chloride	2.0	u	mg/L	2.0
Blank 1	95GHA107-MB1	Chloride	2.0	u	mg/L	2.0
Blank 1	95GSA102-MB1	Sulfate	5.0	u	mg/L	5.0
Blank 1	95GFL070-MB1	Fluoride	0.10	u	mg/L	0.10

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Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Precision Data Report

Sample	Site ID	Parameter	Initial Result	Replicate	RPD
-005REP	MW-14	Chloride	25.5	25.1	1.5
		Fluoride	0.33	0.34	4.3
		Phenolics	0.0092	0.0050 u	NC
		Sulfate	1070	1110	4.2
-012REP	MW-23	Sulfate	249	248	0.50

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Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Accuracy Data Report

Sample	Site ID	Parameter	Spiked Sample	Initial Result	Spiked Amount	% Recov
-005	MW-14	Chloride	38.6	25.5	10.0	132
		Chloride MSD	36.6	25.5	10.0	111
		Fluoride	1.3	0.33	1.0	93.2
		Phenolics	0.055	0.0092	0.050	92.4
		Sulfate	6230	1070	5000	103
-012	MW-23	Sulfate	1410	249	1000	116

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Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Duplicate Spike Report

Sample	Site ID	Parameter	Spike #1 % Recov	Spike #2 % Recov	RPD
-005	MW-14	Chloride	132	111	16.9

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Attn: Mr. Greg Kinsall

Date: Monday October 23rd, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Laboratory Control Standards Report

Lab ID	Parameter	Spiked Amount	Units	Spike #1 % Recov.	Spike #2 % Recov.	RPD
95GHA105-LCS	Chloride	10.0	mg/L	100	100	0.20
95GFL069-LCS	Fluoride	1.0	mg/L	97.1	101	3.9
95GPE046-LCS	Phenolics	0.10	mg/L	95.1	95.6	0.50
95GSA101-LCS	Sulfate	20.0	mg/L	95.4	102	6.9
95GHA117-LCS	Chloride	10.0	mg/L	106	107	1.4
95GHA106-LCS	Chloride	10.0	mg/L	95.4	99.9	4.7
95GHA107-LCS	Chloride	10.0	mg/L	97.6	107	8.9
95GSA102-LCS	Sulfate	20.0	mg/L	104	101	2.8
95GFL070-LCS	Fluoride	1.0	mg/L	102	104	1.6

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-01A							
SILVER, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	001	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	001	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-04B							
SILVER, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	002	W	95HG514	09/19/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	002	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MW-12							
SILVER, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
CHROMIUM, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	003	W	95HG514	09/19/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	003	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MW-13P							
SILVER, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	004	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	004	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-14							
SILVER, SERIAL DILUT	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
SILVER, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
SILVER, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
SILVER, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ARSENIC, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ARSENIC, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SERIAL DILUT	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
BARIUM, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
BARIUM, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
BARIUM, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SERIAL DILU	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
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LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
CADMIUM, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SERIAL DILUT	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SERIAL DIL	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SERIAL DILUTIO	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	005	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MERCURY, SOLUBLE	005 REP	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MERCURY, SOLUBLE	005 MS	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SERIAL DI	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MANGANESE, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MANGANESE, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MANGANESE, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SERIAL DILUT	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
SELENIUM, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SERIAL DILUTIO	005 L	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ZINC, SOLUBLE	005	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ZINC, SOLUBLE	005 REP	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ZINC, SOLUBLE	005 MS	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-19							
SILVER, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95

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Weston Environmental Metrics, Inc.
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American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
BARIUM, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	006	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	006	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-20							
SILVER, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	007	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	007	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-21							
SILVER, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	008	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95

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Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
LEAD, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	008	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-21P							
SILVER, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	009	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	009	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-22							
SILVER, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	010	W	95HG514	09/19/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	010	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MW-22P							
SILVER, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95

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LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
BARIUM, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	011	W	95HG514	09/19/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	011	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MW-23							
SILVER, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	012	W	95HG514	09/19/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	012	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MW-24							
SILVER, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	013	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95

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American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9509G227

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
LEAD, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	013	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-25							
SILVER, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	014	W	95HG514	09/19/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	014	W	NONE	09/19/95	09/21/95	09/25/95	09/25/95
MW-21 DUP							
SILVER, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	015	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	015	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MW-13 DUP							
SILVER, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95

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LABORATORY CHRONICLE

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BARIUM, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	016	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	016	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
FB-01							
SILVER, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
ARSENIC, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
BARIUM, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CADMIUM, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
COBALT, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
CHROMIUM, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
IRON, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
MERCURY, SOLUBLE	017	W	95HG514	09/20/95	09/21/95	09/25/95	09/26/95
MANGANESE, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
NICKEL, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95
LEAD, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
SELENIUM, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/22/95	09/22/95
ZINC, SOLUBLE	017	W	NONE	09/20/95	09/21/95	09/25/95	09/25/95

LAB QC:

MERCURY LABORATORY	LC1 BS	W	95HG514	N/A	N/A	09/25/95	09/26/95
MERCURY LABORATORY	LC2 BS	W	95HG514	N/A	N/A	09/25/95	09/26/95
MERCURY, TOTAL	MB1	W	95HG514	N/A	N/A	09/25/95	09/26/95

SIGNATURE Lydia S. Lyon DATE 9/28/95

NY CERTIFICATION # 11006

Environmental Metrics, Inc. Method Reference

The following methods are used as reference for the analysis of samples contained within this RFW Lot : 95096227

METALS METHODS

CLP	___ ILM03.0			
Aluminum	___ SW-846 6010A	___ EPA 200.7		
Antimony	___ SW-846 6010A	___ EPA 200.7	___ SW-846 7041	___ EPA 204.2
Arsenic	___ SW-846 6010A	___ EPA 200.7	___ SW-846 7060A	✓ EPA 206.2
Barium	___ SW-846 6010A	✓ EPA 200.7		
Beryllium	___ SW-846 6010A	___ EPA 200.7		
Boron	___ SW-846 6010A	___ EPA 200.7		
Cadmium	___ SW-846 6010A	✓ EPA 200.7	___ SW-846 7131A	___ EPA 213.2
Calcium	___ SW-846 6010A	___ EPA 200.7		
Chromium	___ SW-846 6010A	✓ EPA 200.7	___ SW-846 7191	___ EPA 218.2
Cobalt	___ SW-846 6010A	✓ EPA 200.7		
Copper	___ SW-846 6010A	___ EPA 200.7	___ SW-846 7211	___ EPA 220.2
Iron	___ SW-846 6010A	✓ EPA 200.7		
Lead	___ SW-846 6010A	___ EPA 200.7	___ SW-846 7421	✓ EPA 239.2
Lithium	___ SW-846 6010A	___ EPA 200.7		
Magnesium	___ SW-846 6010A	___ EPA 200.7		
Manganese	___ SW-846 6010A	✓ EPA 200.7		
Mercury	___ SW-846 7470A	✓ EPA 245.1		
Mercury	___ SW-846 7471A	___ EPA 245.5		
Molybdenum	___ SW-846 6010A	___ EPA 200.7		
Nickel	___ SW-846 6010A	✓ EPA 200.7		
Potassium	___ SW-846 6010A	___ EPA 200.7		
Selenium	___ SW-846 6010A	___ EPA 200.7	___ SW-846 7740	✓ EPA 270.2
Silicon	___ SW-846 6010A	___ EPA 200.7		
Silver	___ SW-846 6010A	✓ EPA 200.7	___ SW-846 7761	___ EPA 272.2
Sodium	___ SW-846 6010A	___ EPA 200.7		
Strontium	___ SW-846 6010A	___ EPA 200.7		
Thallium	___ SW-846 6010A	___ EPA 200.7	___ SW-846 7841	___ EPA 279.2
Tin	___ SW-846 6010A	___ EPA 200.7		
Titanium	___ SW-846 6010A	___ EPA 200.7		
Vanadium	___ SW-846 6010A	___ EPA 200.7		
Zinc	___ SW-846 6010A	✓ EPA 200.7		

RFW 21-21G-1301/A-08/95

Weston Environmental Metrics, Inc.
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-01A
Project # 10752-005-001-9999
Lab ID: 9509G227-001
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Silver, Soluble	0.010 u	mg/L	0.010
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.029	mg/L	0.020
Chromium, Soluble	0.020 u	mg/L	0.020
Iron, Soluble	24.1	mg/L	0.030
Mercury, Soluble	0.00020 u	mg/L	0.00020
Manganese, Soluble	2.4	mg/L	0.010
Nickel, Soluble	0.090	mg/L	0.020
Lead, Soluble	0.0020 uJ	mg/L	0.0020
Selenium, Soluble	0.0020 uJ	mg/L	0.0020
Zinc, Soluble	0.18	mg/L	0.010

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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-04B
Project # 10752-005-001-9999
Lab ID: 9509G227-002
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	10.4		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	5.0		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	u J	mg/L	0.0020
Selenium, Soluble	0.0020	u J	mg/L	0.0020
Zinc, Soluble	0.035		mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-12
Project # 10752-005-001-9999
Lab ID: 9509G227-003
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0023		mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	14.0		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	4.5		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.010	u	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-13P
Project # 10752-005-001-9999
Lab ID: 9509G227-004
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.17		mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	13.5		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	17.0		mg/L	0.010
Nickel, Soluble	0.22		mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.35		mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-14
Project # 10752-005-001-9999
Lab ID: 9509G227-005
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	1.9		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	0.57		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.010	uJ	mg/L	0.010
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.011		mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-19
Project # 10752-005-001-9999
Lab ID: 9509G227-006
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	0.030	u	mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	0.74		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.010	u	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-20
Project # 10752-005-001-9999
Lab ID: 9509G227-007
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	24.1		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	10.3		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.010	u	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-21
Project # 10752-005-001-9999
Lab ID: 9509G227-008
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.069		mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	0.19		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	0.074		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.010	u	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-21P
Project # 10752-005-001-9999
Lab ID: 9509G227-009
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0062		mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	36.0		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	9.8		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.011		mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-22
Project # 10752-005-001-9999
Lab ID: 9509G227-010
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	15.2		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	5.0		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.019		mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-22P
Project # 10752-005-001-9999
Lab ID: 9509G227-011
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.096		mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	0.030	u	mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	0.014		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.010	u	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-23
Project # 10752-005-001-9999
Lab ID: 9509G227-012
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Silver, Soluble	0.010 u	mg/L	0.010
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.020 u	mg/L	0.020
Chromium, Soluble	0.020 u	mg/L	0.020
Iron, Soluble	5.1	mg/L	0.030
Mercury, Soluble	0.00020 u	mg/L	0.00020
Manganese, Soluble	3.9	mg/L	0.010
Nickel, Soluble	0.024	mg/L	0.020
Lead, Soluble	0.0020 uJ	mg/L	0.0020
Selenium, Soluble	0.0020 uJ	mg/L	0.0020
Zinc, Soluble	0.045	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-24
Project # 10752-005-001-9999
Lab ID: 9509G227-013
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Silver, Soluble	0.010 u	mg/L	0.010
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.43	mg/L	0.020
Chromium, Soluble	0.020 u	mg/L	0.020
Iron, Soluble	85.3	mg/L	0.030
Mercury, Soluble	0.00020 u	mg/L	0.00020
Manganese, Soluble	80.4	mg/L	0.010
Nickel, Soluble	0.23	mg/L	0.020
Lead, Soluble	0.0020 uJ	mg/L	0.0020
Selenium, Soluble	0.0020 uJ	mg/L	0.0020
Zinc, Soluble	0.22	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-25
Project # 10752-005-001-9999
Lab ID: 9509G227-014
Sample Date: 09/19/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0031		mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.031		mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	17.5		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	6.7		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.024		mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-13 DUP
Project # 10752-005-001-9999
Lab ID: 9509G227-016
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.17		mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	14.0		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	17.1		mg/L	0.010
Nickel, Soluble	0.23		mg/L	0.020
Lead, Soluble	0.0020	uJ	mg/L	0.0020
Selenium, Soluble	0.0020	uJ	mg/L	0.0020
Zinc, Soluble	0.36		mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: MW-21 DUP
Project # 10752-005-001-9999
Lab ID: 9509G227-015
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.065		mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	0.22		mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	0.072		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	u J	mg/L	0.0020
Selenium, Soluble	0.0020	u J	mg/L	0.0020
Zinc, Soluble	0.010	u	mg/L	0.010

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Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

RE: FB-01
Project # 10752-005-001-9999
Lab ID: 9509G227-017
Sample Date: 09/20/95
Date Received: 09/21/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Silver, Soluble	0.010	u	mg/L	0.010
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Chromium, Soluble	0.020	u	mg/L	0.020
Iron, Soluble	0.030	u	mg/L	0.030
Mercury, Soluble	0.00020	u	mg/L	0.00020
Manganese, Soluble	0.010	u	mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Lead, Soluble	0.0020	u J	mg/L	0.0020
Selenium, Soluble	0.0020	u J	mg/L	0.0020
Zinc, Soluble	0.010	u	mg/L	0.010

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Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Method Blank Data Report

Sample	Lab ID	Parameter	Result	Units	Reporting Limit
Blank 1	95HG514-MB1	Mercury, Total	0.00020 u	mg/L	0.00020

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Precision Data Report

Sample	Site ID	Parameter	Initial Result	Replicate	RPD
-005REP	MW-14	Silver, Soluble	0.010 u	0.010 u	NC
		Arsenic, Soluble	0.0020 u	0.0020 u	NC
		Barium, Soluble	0.050 u	0.050 u	NC
		Cadmium, Soluble	0.010 u	0.010 u	NC
		Cobalt, Soluble	0.020 u	0.020 u	NC
		Chromium, Soluble	0.020 u	0.020 u	NC
		Iron, Soluble	1.9	1.9	1.2
		Mercury, Soluble	0.00020 u	0.00020 u	NC
		Manganese, Soluble	0.57	0.56	2.5
		Nickel, Soluble	0.020 u	0.020 u	NC
		Lead, Soluble	0.010 u	0.010 u	NC
		Selenium, Soluble	0.0020 u	0.0020 u	NC
		Zinc, Soluble	0.011	0.010 u	NC

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2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Accuracy Data Report

Sample	Site ID	Parameter	Spiked Sample	Initial Result		Spiked Amount	% Reco
-005	MW-14	Silver, Soluble	0.041	0.010	u	0.050	82.
		Arsenic, Soluble	0.036	0.0020	u	0.040	89.
		Barium, Soluble	2.0	0.050	u	2.0	101
		Cadmium, Soluble	0.056	0.010	u	0.050	112
		Cobalt, Soluble	0.48	0.020	u	0.50	97.
		Chromium, Soluble	0.20	0.020	u	0.20	97.
		Iron, Soluble	2.9	1.9		1.0	95.
		Mercury, Soluble	0.00094	0.00020	u	0.0010	93.
		Manganese, Soluble	1.0	0.57		0.50	93.
		Nickel, Soluble	0.48	0.020	u	0.50	95.
		Lead, Soluble	0.014	0.010	u	0.020	71.
		Selenium, Soluble	0.0072	0.0020	u	0.010	72.
		Zinc, Soluble	0.50	0.011		0.50	98.

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday September 27th, 1995

Project # 10752-005-001-9999
Lab Batch: 9509G227

Inorganic Laboratory Control Standards Report

Lab ID	Parameter	Spiked Amount	Units	Spike #1 % Recov.	Spike #2 % Recov.	RPD
95HG514-LC1	Mercury, LCS	0.0020	mg/L	104	109	4.0

WESTON Analytics Use Only
9509C227

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

62

Client: AMERICAN STEEL FOUNDRY
Est. Final Proj. Sampling Date: 9/20/95
Work Order #: 10752-005-001
Project Contact/Phone #: Greg Kinsall/Jamel X4000
AD Project Manager:
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #																
#/Type Container	Liquid					Amber			Plastic		1 Plastic					
	Solid															
Volume	Liquid					250ml			1L		1L					
	Solid															
Preservatives						H_2SO_4			HNO_3		-					
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb	Phenols			Metal	CN	Ground					

WESTON Analytics Use Only

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Total Phenols	Soluble	Ground Sulfate	
01	MW-01A			W	9/20	1500	✓	✓	✓	
02	MW-04B				9/19	1645	✓	✓	✓	9-21-95
03	MW-12				9/19	1830	✓	✓	✓	
04	MW-13P				9/20	1330	✓	✓	✓	
05	MW-14	✓	✓		9/20	1700	✓	✓	✓	
06	MW-19				9/20	1600	✓	✓	✓	
07	MW-20				9/20	1215	✓	✓	✓	
08	MW-21				9/20	~~1900~~ 1105	✓	✓	✓	
09	MW-21P				9/20	0900	✓	✓	✓	
010	MW-22				9/19	1530	✓	✓	✓	

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
Soluble metals: include Arsenic, Barium, Cadmium, Chromium, Cobalt, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Zinc
Ground Sulfate, Chloride, Fluoride
Custody Seal # 0037448

DATE/REVISIONS:
1. MS/MSD [illegible] 9/21/95 15:15
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered X
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
Jamel	Gulf Coast	9/21/95					

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES: See SDR

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

WESTON Analytics Use Only

95090227

Custody Transfer Record/Lab Work Request

WESTON MANAGERS DESIGNERS/CONSULTANTS

Client: AMERICAN STEEL FOUNDRY
Est. Final Proj. Sampling Date: 9/20/95
Work Order #: 10752-005-001
Project Contact/Phone #: Greg Kinsell/Jamel X4000
AD Project Manager:
QC: Del: TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #																			
#/Type Container	Liquid							Amber				Plastic		Plastic					
	Solid																		
Volume	Liquid							250ml				1L		1L					
	Solid																		
Preservatives								H_2SO_4				HNO3		–					
ANALYSES REQUESTED →		ORGANIC										INORG							
		VOA	BNA	Pest/PCB	Herb	Phenols						Metal	CN	General					

WESTON Analytics Use Only

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	Total Phenols	Solids Metals	Chloride Fluoride Sulfate
011	MW-22P			W	9/19/95	1615	✓	✓	✓
012	MW-23			W	9/19/95	1730	✓	✓	✓
013	MW-24			W	9/20/95	1040	✓	✓	✓
014	MW-25			W	9/19/95	1350	✓	✓	✓
015	MW-21 DUP			W	9/20/95	1105	✓	✓	✓
016	MW-13 DUP			W	9/20/95	1415	✓	✓	✓
017	~~MW~~ FB-01			W	9/20/95	1745	✓	✓	✓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
Metals (soluble) include: Arsenic, Barium, Cadmium, Chromium, Cobalt, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Silver, Zinc
General: Sulfate, Chloride, Fluoride
Custody Seal# 0037446

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___ Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
Jamel	Gulf Coast	9/21/95	
	K Hanc	9/21/95	12 41

Relinquished by	Received by	Date	Time

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

Weston Environmental Metrics, Inc.

RFW#: 95096227

Sample Discrepancy Report (SDR)

Client: American Steel Foundry
Contact: Greg Kinsall
Project:
Phone #: 708·918·4000
FAX #:

~~Analyses:~~

Matrix: Water Soil Other
Deliverable Type: (circle)
CLP STD SPEC

1.a. Type of Sample Discrepancy COC received: Yes No Quote from PM: Yes No

COC / Sample				LOG-IN		Client		Unit	
X	ID Discrepancy		Rec'd past hold time		Log-in past hold time		Changed Analyses		Analyzed past hold time
	Date Discrepancy		Improper Preserv.		Log-in Error		Improper bottle type		Missing sample/extract
	Incomplete		Missing sample/extract				Label unreadable		Insufficient sample
	Unreadable		Container broken				Insufficient sample		
	Cooler temp. ____ C		- sample lost						
	Quote Discrepancy		- suspect contamination						
			Bubbles in VOA vials						
									EDD

1.b. Lab ID (COC/Client ID) Deficiency/Discrepancy

(1) ID MW-21 Gen Bottle dated 9.20.95 Time Nothing on bottle
C of C dated 9-20-95 Time 11:05 11:05 R

(2) ID MW-21P Gen Bottle has ID MW-21 dated 9:20-95 Time 9:05
(3) L.H 9-21-95 ~~C of C~~ Phenol jar has ID MW-21 " " Time 9:00
C of C dated 9-20-95 Time 9:00

(4) 004 label = MW 13P 9-20 14:15 Cap = MW 13P Dup
016 label = MW 13P Dup 9-20 14:15 Cap = MW 13P

Initiator sign: L. Henri Date: 9-21-95

2.a. PM Establish Action Plan:

	Cancel		Bottle/jar replaced		Change Test Code from ____ to ____
	Add		Lid replaced		Change Due Date from ____ to ____
	Place on hold		Analyze samples		Include in Case Narrative
	Log-in		Analyze Past Hold		Amend EDD
	Subcontract		Preserve then Analyze		

2.b. Special Action:

Name:		Action Initiator Initial & Date:		Action Completion Initial & Date:	
Login	(1)(2)(3) Follow COC	RW	9/22	L.H	9-22-95
Login	(4) Since samples are duplicates; switch caps to the correctly labeled bottle	RW	9/22	L.H	9-22-95

3. Receipt of Copies: (INITIAL AND DATE)

1. GC	4. W.C.
2. GC/MS	5. Digest.
3. Metals	6. Extract.

Distribution and Copy to QA: L.H 9-22-95

4. PM Final Approval of All Actions Taken:

Send copy to Client

Signature: [signature] for GDH. Date: 9/22/95

5. QA For Quality Measurement Only:

Final Distribution - Attach original to worksheet and send a copy to QA

Revision Date: 8/29/95

C:\MSOFFICE\EXCEL\SDRRDR\SDR.XLS

RFW 2-21-0007/B-8/95

July 21, 1994

Mr. Terry Bradway
American Steel Foundries
1001 East Broadway
Alliance, Ohio 44601

Re: Results of June, 1994 Groundwater Sampling - Third Quarter
American Steel Foundries - Sebring Facility
Alliance, Ohio

Dear Terry,

This letter report presents the results of the third quarterly groundwater sampling conducted at the American Steel Foundries (ASF) Sebring Facility located in Alliance, Ohio. Sampling was performed by RMT, Inc. during the period June 15 through 17, 1994 in accordance with the Groundwater Quality Assessment Plan (RMT, Inc., 1992) and Groundwater Sampling and Analysis Plan (RMT, Inc., 1992).

Description of Monitoring Program

The Groundwater Quality Assessment Plan (Plan) requires that during the first quarterly sampling wells MW-1A, MW-4A, MW-13, MW-14, MW-19, MW-19P, MW-20, MW-21, MW-21P, MW-22, MW-22P, MW-25P, and MW-23 be sampled and analyzed for:

- Water quality and indicator parameters (Table 3-1 of the Plan)
- Volatile organic compounds (Table 3-2 of the Plan)
- Appendix IX Metals (Table 3-3 of the Plan)

After the first quarterly sampling, the results were reviewed and the sampling program for the following three quarters established. This sampling program includes the following and was adhered to for the third quarter sampling event.

- Water quality and indicator parameters (Table 3-1 of the Plan)
- Compounds found in the ASF Alliance facility waste stream (Table 3-5 of the Plan)
- Compounds detected at concentrations above the practical quantitation limits (PQL) during the first quarterly sampling round (Table 3-4 of the Plan, revised).

RMT INC.

RESIDUALS MANAGEMENT TECHNOLOGY, INC. — CHICAGO
999 PLAZA DRIVE • SUITE 100
SCHAUMBURG, IL • 60173-5407
708/995-1500 • 708/995-1900 FAX

2169.17:MSZ:ASF0208

Discussion of Analytical Results

Inorganic analytical results are presented in Appendix A. Recovery in well MW-19P was not sufficient for all analyses to be run. Sulfide was omitted due to lack of sample volume. This well will be purged in advance of the next sampling event, in order to allow more recovery time. Appendix B contains the laboratory reports, and Appendix C contains the Chain-of-Custody forms for the third round of sampling.

Groundwater Level Measurements and Well Inspections

Groundwater level measurements were collected concurrently with the third quarterly sampling event. Groundwater elevations are presented on Table 1. Based on these groundwater elevations groundwater flow direction is toward the west, consistent with previous observations.

Each well was inspected prior to sampling. Based on that inspection, each well is in good working order and no redevelopment or repair is necessary at this time.

Conclusion

Based on the results from the third quarterly sampling event, it does not appear that the landfill is affecting groundwater quality. A summary report will be prepared after the fourth quarter sampling as required by OAC 3745-65-94 et. seq.

If you have any questions regarding this report please contact us.

Sincerely,
RMT, Inc.,

Alan J. Schmidt

Alan J. Schmidt, C.P.G.

Lynn Hall

Lynn Hall
Project Manager

cc: Ms. Bernadette Wellman, ASF

Table 1

GROUNDWATER ELEVATIONS
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
ALLIANCE, OHIO

Well Designation	Geologic Material	Top of Casing Elevation	June 15 - 17, 1994	
			Depth to Water	Groundwater Elevation
MW-1	Shale	1126.73	35.53	1091.20
MW-1A	Shale	1126.09	34.53	1091.56
MW-2	Shale	1101.96	25.02	1076.94
MW-3	Spoils	1093.14	16.23	1076.89
MW-4	Spoils	1085.13	8.50	1076.63
MW-4A	Spoils	1085.20	8.59	1076.61
MW-12	Sand and Spoils	1087.94	10.31	1077.63
MW-13	Spoils	1107.70	28.60	1079.10
MW-14	Shale	1131.18	50.60	1080.58
MW-19	Bedrock	1141.16	27.71	1113.45
MW-19P	Bedrock	1141.36	102.29	1039.07
MW-20	Bedrock	1113.21	33.90	1079.31
MW-21	Spoils	1101.12	22.56	1078.56
MW-21P	Bedrock	1100.17	22.75	1077.42
MW-22	Spoils	1091.01	13.83	1077.18
MW-22P	Bedrock	1091.23	19.40	1071.83
MW-23	Spoils	1107.81	19.07	1088.74

Table 3-1[1]

WATER QUALITY PARAMETERS AND WASTE CONSTITUENT ANALYTICAL METHODS AND PRACTICAL QUANTITATION LIMITS

Parameters	SW-846 Analytical Method	Practical Quantitation Limits
pH	9040/9041	0.1 pH unit
Alkalinity, carbonate/bicarbonate	403	20 mg/L
Total Organic Carbon	9060	0.25 mg/L
Total Organic Halogen	9020	0.010 mg/L
Iron - ICP[2]	6010	0.10 mg/L
Chloride[2]	9250	2.0 mg/L
Fluoride[2]	EPA 340.2	0.1 mg/L
Manganese - ICP[2]	6010	0.005 mg/L
Nitrate, Nitrogen	9200	0.05 mg/L
Phenols (colorimetric)[2]	9066	0.01 mg/L
Sodium - ICP	6010	0.50 mg/L
Specific Conductance	9050	10 μmhos/cm
Sulfate[2]	9036	10 mg/L

Notes:

Practical Quantitation Limits are for RMT Laboratories.
ICP - Inductively Coupled Plasma Emission Spectrophotometry.
(1) Table originally presented in Groundwater Sampling and Analysis Plan (RMT, 1992).
(2) Compound or element is found in ASF wastestream.

Revised Table 3-3[1]

APPENDIX IX - METALS, METHODS OF ANALYSIS AND PRACTICAL QUANTITATION LIMITS (PQL's)

Analyte	PQL in µg/L	SW-846 Method
Antimony	10	7041
Arsenic[2]	3	7060
Barium[2]	50	6010
Cadmium[2]	0.3	7131
Chromium (total)[2]	2	7191
Cobalt	50	6010
Copper	3	7211
Lead[2]	3	7421
Mercury[2]	0.2	7470,7471
Nickel[2]	40	6010
Selenium[2]	3	7740
Silver[2]	1	7761
Tin	200	RMT Lab Internal
Zinc[2]	20	6010
Sulfide (total)	1000	9030

Notes:

(1) Table originally presented in Groundwater Sampling and Analysis Plan (RMT, 1992). Revised based on First Quarter groundwater sampling results.

(2) Compound or element is found in ASF wastestream.

Table 3-5[1]

COMPOUNDS FOUND IN ASF WASTESTREAM

Arsenic	Lead
Barium	Manganese
Cadmium	Mercury
Chloride	Nickel
Chromium	Phenol
Fluoride	Selenium
Iron	Silver
Sulfate	Zinc

Note:

(1) Table originally presented in Groundwater Sampling and Analysis Plan (RMT, 1992).

Appendix A

SUMMARY OF ANALYTICAL RESULTS

PROJECT NUMBER: 2169.18

AMERICAN STEEL FOUNDRIES - ALLIANCE, OHIO
INORGANIC RESULTS

PARAMETER	UNITS	FIELD BLANK 16-JUN-94 4855-008	MW-01A 16-JUN-94 4855-005	MW-04A 16-JUN-94 4855-001	MW-13 15-JUN-94 4842-001	MW-14 17-JUN-94 4861-003	MW-19 16-JUN-94 4855-002
ALKALINITY, BICARBONATE	mg/L	<20	<20	450	42	200	<20
ALKALINITY, CARBONATE	mg/L	<20	<20	<20	<20	<20	<20
ANTIMONY, DISSOLVED	ug/L	<10	<10	11	12	<10	<10
ARSENIC, DISSOLVED	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
BARIUM, DISSOLVED	ug/L	<50	<50	<50	<50	<50	<50
CADMIUM, DISSOLVED	ug/L	<0.30	2.0	<0.30	2.3	<0.30	0.33
CHLORIDE	mg/L	<2.0	220	8.5	69	23	5.1
CHROMIUM, DISSOLVED	ug/L	<2.0	2.9	<2.0	<2.0	<2.0	<2.0
COBALT, DISSOLVED	ug/L	<50	<50	63	130	<50	<50
CONDUCTANCE, SPECIFIC	UMHOS/CM	NA	1640	1890	2050	2050	1430
COPPER, DISSOLVED	ug/L	<3.0	32	<3.0	<3.0	<3.0	<3.0
FLUORIDE	mg/L	<0.10	1.4	0.2	0.84	0.34	<0.10
IRON, DISSOLVED	ug/L	<100	21000	18000	24000	1400	<100
LEAD, DISSOLVED	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
MANGANESE, DISSOLVED	ug/L	<5.0	2200	5500	15000	670	600
MERCURY, DISSOLVED	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
NICKEL, DISSOLVED	ug/L	<40	71	59	210	<40	<40
NITROGEN, NITRATE	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	1.6
pH, FIELD	SU	NA	4.1	6.2	5.4	7.1	6.5
PHENOLICS, TOTAL RECOVERABLE	mg/L	<0.010	<0.010	<0.010	0.020	0.012	0.010
SELENIUM, DISSOLVED	ug/L	<3.0	<3.0	<3.0	<6.0	<3.0	<3.0
SILVER, DISSOLVED	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SODIUM, DISSOLVED	ug/L	<500	110000	30000	40000	39000	5400
SULFATE	mg/L	<10	460	620	1100	1000	36
SULFIDE, TOTAL	mg/L	<1.0	<1.0	2.1	<1.0	2.5	1.2
TIN, DISSOLVED	ug/L	<500	<500	<500	<500	<500	<500
TOTAL ORGANIC CARBON AS NPOC	mg/L	<0.25	1.7	2.4	3.3	1.2	0.34
TOTAL ORGANIC HALIDES	ug/L	<5.0	14	5.9	6.2	6.8	7.6
ZINC, DISSOLVED	ug/L	<20	160	61	370	<20	<20

PROJECT NUMBER: 2169.18

AMERICAN STEEL FOUNDRIES - ALLIANCE, OHIO
INORGANIC RESULTS

PARAMETER	UNITS	MW-19P 17-JUN-94 4861-004	MW-20 16-JUN-94 4855-007	MW-21 17-JUN-94 4861-005	MW-21P 16-JUN-94 4855-003	MW-22 15-JUN-94 4842-002	MW-22P 16-JUN-94 4855-004
ALKALINITY, BICARBONATE	mg/L	600	350	360	370	160	770
ALKALINITY, CARBONATE	mg/L	<20	<20	<20	<20	<20	<20
ANTIMONY, DISSOLVED	ug/L	10	<10	<10	<10	<10	<10
ARSENIC, DISSOLVED	ug/L	14	<3.0	5.9	<3.0	<3.0	<3.0
BARIUM, DISSOLVED	ug/L	180	<50	<50	140	<50	110
CADMIUM, DISSOLVED	ug/L	<0.30	0.30	<0.30	<0.30	<0.30	<0.30
CHLORIDE	mg/L	23	16	42	35	42	57
CHROMIUM, DISSOLVED	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
COBALT, DISSOLVED	ug/L	<50	<50	<50	<50	<50	<50
CONDUCTANCE, SPECIFIC	UMHOS/CM	2210	2110	2600	1820	1340	2370
COPPER, DISSOLVED	ug/L	5.5	<3.0	<3.0	<3.0	<3.0	<3.0
FLUORIDE	mg/L	3.0	0.40	0.85	3.1	0.50	9.5
IRON, DISSOLVED	ug/L	<100	14000	35000	<100	17000	<100
LEAD, DISSOLVED	ug/L	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
MANGANESE, DISSOLVED	ug/L	22	7600	14000	36	6000	9.4
MERCURY, DISSOLVED	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
NICKEL, DISSOLVED	ug/L	<40	<40	<40	<40	<40	<40
NITROGEN, NITRATE	mg/L	39	<0.050	<0.050	0.20	<0.050	<0.050
pH, FIELD	SU	8.1	8.5	6.4	7.5	6.3	8.1
PHENOLICS, TOTAL RECOVERABLE	mg/L	<0.010	<0.010	<0.010	<0.010	0.011	<0.010
SELENIUM, DISSOLVED	ug/L	3.1	<3.0	<3.0	<3.0	<6.0	<3.0
SILVER, DISSOLVED	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SODIUM, DISSOLVED	ug/L	490000	110000	130000	330000	43000	580000
SULFATE	mg/L	370	1000	1200	330	500	320
SULFIDE, TOTAL	mg/L	-	<1.0	<1.0	2.0	<1.0	1.9
TIN, DISSOLVED	ug/L	<500	<500	<500	<500	<500	<500
TOTAL ORGANIC CARBON AS NPOC	mg/L	13	5.3	16	2.4	4	3.1
TOTAL ORGANIC HALIDES	ug/L	21	7.9	10	8.2	12	7.2
ZINC, DISSOLVED	ug/L	<20	21	24	<20	25	<20

PROJECT NUMBER: 2169.18

AMERICAN STEEL FOUNDRIES - ALLIANCE, OHIO
INORGANIC RESULTS

PARAMETER	UNITS	MW-23 16-JUN-94 4855-006
ALKALINITY, BICARBONATE	mg/L	76
ALKALINITY, CARBONATE	mg/L	<20
ANTIMONY, DISSOLVED	ug/L	<10
ARSENIC, DISSOLVED	ug/L	<3.0
BARIUM, DISSOLVED	ug/L	<50
CADMIUM, DISSOLVED	ug/L	<0.30
CHLORIDE	mg/L	87
CHROMIUM, DISSOLVED	ug/L	<2.0
COBALT, DISSOLVED	ug/L	<50
CONDUCTANCE, SPECIFIC	UMHOS/CM	1580
COPPER, DISSOLVED	ug/L	<3.0
FLUORIDE	mg/L	0.15
IRON, DISSOLVED	ug/L	17000
LEAD, DISSOLVED	ug/L	<3.0
MANGANESE, DISSOLVED	ug/L	4000
MERCURY, DISSOLVED	ug/L	<0.20
NICKEL, DISSOLVED	ug/L	<40
NITROGEN, NITRATE	mg/L	<0.050
pH, FIELD	SU	6.4
PHENOLICS, TOTAL RECOVERABLE	mg/L	<0.010
SELENIUM, DISSOLVED	ug/L	<3.0
SILVER, DISSOLVED	ug/L	<1.0
SODIUM, DISSOLVED	ug/L	17000
SULFATE	mg/L	750
SULFIDE, TOTAL	mg/L	<1.0
TIN, DISSOLVED	ug/L	<500
TOTAL ORGANIC CARBON AS NPOC	mg/L	0.77
TOTAL ORGANIC HALIDES	ug/L	8.3
ZINC, DISSOLVED	ug/L	46

Appendix B

ANALYTICAL LABORATORY REPORT

RMT LABORATORIES · 744 HEARTLAND TRAIL · MADISON, WI · 53717-1934 · P.O. BOX 8923 · MADISON, WI · 53708-8923 · 608/831-4444 · 608/831-7530 FAX

CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-005
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: MW-1A

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	<20	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	220	mg/L
Fluoride	1.4	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	460	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	1.7	mg/L
Total organic halides	14	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	2.0	ug/L
Chromium, dissolved	2.9	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	32	ug/L
Iron, dissolved	21000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	2200	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	71	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	110000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	160	ug/L

Approval Signature Jeffrey A. Gordon 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-001
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: MW-4A

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	450	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	8.5	mg/L
Fluoride	0.20	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	620	mg/L
Sulfide	2.1	mg/L
Total organic carbon as NPOC	2.4	mg/L
Total organic halides	5.9	ug/L
Antimony, dissolved	11	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	63	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	18000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	5500	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	59	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	30000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	61	ug/L

Approval Signature Jeffrey G. Hardin 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4842-001
PROJECT #: 02169.17
WORK ORDER #: 4842
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/15/94
STATION ID: MW-13

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	42	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	69	mg/L
Fluoride	0.84	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	0.020	mg/L
Sulfate	1100	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	3.3	mg/L
Total organic halides	6.2	ug/L
Antimony, dissolved	12	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	2.3	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	130	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	24000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	15000	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	210	ug/L
Selenium, dissolved	<6.0 S	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	40000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	370	ug/L

Jeff Gearhart 7-11-94

Approval Signature

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4861-003
PROJECT #: 02169.17
WORK ORDER #: 4861
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/17/94
STATION ID: MW-14

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	200	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	23	mg/L
Fluoride	0.34	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	0.012	mg/L
Sulfate	1000	mg/L
Sulfide	2.5	mg/L
Total organic carbon as NPOC	1.2	mg/L
Total organic halides	6.8	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	1400	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	670	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	39000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	<20	ug/L

Approval Signature Jeffrey G. Gordon 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-002
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: MW-19

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	<20	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	5.1	mg/L
Fluoride	<0.10	mg/L
Nitrogen, nitrate	1.6	mg/L
Phenolics, total recoverable	0.010	mg/L
Sulfate	36	mg/L
Sulfide	1.2	mg/L
Total organic carbon as NPOC	0.34	mg/L
Total organic halides	7.6	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	0.33	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	<100	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	600	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	5400	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	<20	ug/L

Approval Signature Jeffrey A. Gordon 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4861-004
PROJECT #: 02169.17
WORK ORDER #: 4861
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/17/94
STATION ID: MW-19P

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	600	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	23	mg/L
Fluoride	3.0	mg/L
Nitrogen, nitrate	39	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	370	mg/L
Total organic carbon as NPOC	13	mg/L
Total organic halides	21	ug/L
Antimony, dissolved	10	ug/L
Arsenic, dissolved	14	ug/L
Barium, dissolved	180	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	5.5	ug/L
Iron, dissolved	<100	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	22	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	3.1	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	490000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	<20	ug/L

Approval Signature Jeffrey A. Hardin 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-007
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: MW-20

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	350	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	16	mg/L
Fluoride	0.40	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	1000	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	5.3	mg/L
Total organic halides	7.9	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	14000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	7600	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	110000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	21	ug/L

Approval Signature Jeffrey A. Gordon 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4861-005
PROJECT #: 02169.17
WORK ORDER #: 4861
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/17/94
STATION ID: MW-21

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	360	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	42	mg/L
Fluoride	0.85	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	1200	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	16	mg/L
Total organic halides	10	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	5.9	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	35000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	14000	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	130000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	24	ug/L

Approval Signature Jeffrey G. Gordon 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-003
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: MW-21P

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	370	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	35	mg/L
Fluoride	3.1	mg/L
Nitrogen, nitrate	0.20	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	330	mg/L
Sulfide	2.0	mg/L
Total organic carbon as NPOC	2.4	mg/L
Total organic halides	8.2	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	140	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	<100	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	36	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	330000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	<20	ug/L

Approval Signature Jeffrey A. Hoch 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4861-006
PROJECT #: 02169.17
WORK ORDER #: 4861
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/17/94
STATION ID: MW-21 DUP

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	360	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	42	mg/L
Fluoride	0.60	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	1200	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	7.0	mg/L
Total organic halides	8.4	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	4.9	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	35000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	12000	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	130000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	25	ug/L

Approval Signature Jeffrey A. Gordon 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4842-002
PROJECT #: 02169.17
WORK ORDER #: 4842
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/15/94
STATION ID: MW-22

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	160	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	42	mg/L
Fluoride	0.50	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	0.011	mg/L
Sulfate	500	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	4.0	mg/L
Total organic halides	12	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	17000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	6000	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<6.0 S	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	43000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	25	ug/L

Jeff Gearhart 7-11-94

Approval Signature

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-004
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: MW-22P

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	770	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	57	mg/L
Fluoride	9.5	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	320	mg/L
Sulfide	1.9	mg/L
Total organic carbon as NPOC	3.1	mg/L
Total organic halides	7.2	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	110	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	<100	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	9.4	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	580000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	<20	ug/L

Approval Signature Jeffrey A. Hardin 7-11-94

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CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-006
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: MW-23

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	76	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	87	mg/L
Fluoride	0.15	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	750	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	0.77	mg/L
Total organic halides	8.3	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	17000	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	4000	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	17000	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	46	ug/L

Jeffrey A. Gordon 7-11-94
Approval Signature

RMT LABORATORIES · 744 HEARTLAND TRAIL · MADISON, WI · 53717-1934 · P.O. BOX 8923 · MADISON, WI · 53708-8923 · 608/831-4444 · 608/831-7530 FAX

CLIENT: AMERICAN STEEL FOUNDRIES
SAMPLE #: 4855-008
PROJECT #: 02169.17
WORK ORDER #: 4855
WI DNR LAB ID: 113138520

REPORT DATE: 07/11/94
COLLECTION DATE: 06/16/94
STATION ID: RINSE BLANK #1

INORGANIC ANALYSIS REPORT

PARAMETER	RESULT	UNITS
Alkalinity, bicarbonate as CaCO3	<20	mg/L
Alkalinity, carbonate as CaCO3	<20	mg/L
Chloride	<2.0	mg/L
Fluoride	<0.10	mg/L
Nitrogen, nitrate	<0.050	mg/L
Phenolics, total recoverable	<0.010	mg/L
Sulfate	<10	mg/L
Sulfide	<1.0	mg/L
Total organic carbon as NPOC	<0.25	mg/L
Total organic halides	<5.0	ug/L
Antimony, dissolved	<10	ug/L
Arsenic, dissolved	<3.0	ug/L
Barium, dissolved	<50	ug/L
Cadmium, dissolved	<0.30	ug/L
Chromium, dissolved	<2.0	ug/L
Cobalt, dissolved	<50	ug/L
Copper, dissolved	<3.0	ug/L
Iron, dissolved	<100	ug/L
Lead, dissolved	<3.0	ug/L
Manganese, dissolved	<5.0	ug/L
Mercury, dissolved	<0.20	ug/L
Nickel, dissolved	<40	ug/L
Selenium, dissolved	<3.0	ug/L
Silver, dissolved	<1.0	ug/L
Sodium, dissolved	<500	ug/L
Tin, dissolved	<500	ug/L
Zinc, dissolved	<20	ug/L

Approval Signature Jeffrey A. Gordon 7-11-94

RMT LABORATORIES · 744 HEARTLAND TRAIL · MADISON, WI · 53717-1934 · P.O. BOX 8923 · MADISON, WI · 53708-8923 · 608/831-4444 · 608/831-7530 FAX

Inorganic Data Qualifier Sheet

S The reported value was determined by the Method of Standard Addition (MSA).

Appendix C

CHAIN-OF-CUSTODY FORMS

RMT LABORATORIES
Madison, WI 53717
744 Heartland Trail
Phone (608) 831-4444
FAX (608) 831-7530
Santa Monica, CA
Atlanta, GA
Baton Rouge, LA
Troy, MI
Grand Ledge, MI
Nashville, TN
Greenville, SC
Schaumburg, IL
Dublin, OH
Waukesha, WI

F-268 (R2/92)
(Use Black Ink Only)

CHAIN OF CUSTODY RECORD

№ 040310

Bottles Prepared by: | Date/Time

Project No.: 2169.17 | Client: ASF

Filtered (Yes/No) N N Y Y N N N N N N
Preserved (Code) A E B B D F A A C C

Code: A - None
B - HNO3
C - H_2SO_4
D - NaOH
E - HCl
F - ____

RMT Lab NO.	Yr. 94 Date	Time	Sample Station ID	Total Number Of Containers	Container Inventory 60 ml	40 ml	1L pl	500 gl am	1L pl	1L pl	1L pl	250 ml pl	125 ml gl am	1L gl am	Comments:
	6/16	1005	MW-4A	12		3	1	1	1	1	1	1	1	2	
	6/16	1050	MW-19	12		3	1	1	1	1	1	1	1	2	
	6/16	1130	MW-21P	12		3	1	1	1	1	1	1	1	2	
	6/16	1215	MW-22P	12		3	1	1	1	1	1	1	1	2	
	6/16	1255	MW-1A	12		3	1	1	1	1	1	1	1	2	
	6/16	1340	MW-23	12		3	1	1	1	1	1	1	1	2	
	6/16	1430	MW-20	12		3	1	1	1	1	1	1	1	2	
	6/16	1600	Rinse Blank #1	12		3	1	1	1	1	1	1	1		

SAMPLER

Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time
① Randall L Welch	6/16/94 1810	② Fed Ex Shipper Name & # 9285191436	6/16/94 1810
③		④ Shipper Name & #	
⑤		⑥ Shipper Name & #	

HAZARDS ASSOCIATED WITH SAMPLES

(For Lab Use Only)
Receipt Temp ____ Receipt pH ____

Custody Seal | Present/Absent | Seal | Intact/Not Intact | Seal #'s

RMT LABORATORIES
Madison, WI 53717
744 Heartland Trail
Phone (608) 831-4444
FAX (608) 831-7530
Santa Monica, CA
Atlanta, GA
Baton Rouge, LA
Troy, MI
Grand Ledge, MI
Nashville, TN
Greenville, SC
Schaumburg, IL
Dublin, OH
Waukesha, WI

F-268 (R2/92)
(Use Black Ink Only)

CHAIN OF CUSTODY RECORD

№ 040311

Bottles Prepared by: | Date/Time

Project No: 216917 | Client: ASF

Filtered (Yes/No) N N N N N N N N
Preserved (Code) A E B B D F A A

Code: A - None
B - HNO3
C - H_2SO4
D - NaOH
E - HCl
F - _____

RMT Lab NO.	Yr. 94 Date	Time	Sample Station ID	Total Number Of Containers	Container Inventory: 60 ml	40 ml	liter pl	500 gl an	1L pl	1L pl	1L pl	250 ml pl	125 ml gl an	1L gl am	Comments:
	6/15	1710	MW-13	12	–	3	1	1	1	1	1	1	1	2	
	6/15	1545	MW-22	12	–	3	1	1	1	1	1	1	1	2	

SAMPLER
Relinquished by (Sig.) ① [signature] | Date/Time 6/15/94 1700 | Received by (Sig.) ② Fed EX Shipper Name & # 9285191425 | Date/Time

Relinquished by (Sig.) ③ | Date/Time | Received by (Sig.) ④ Shipper Name & # | Date/Time

Relinquished by (Sig.) ⑤ | Date/Time | Received by (Sig.) ⑥ Shipper Name & # | Date/Time

HAZARDS ASSOCIATED WITH SAMPLES

(For Lab Use Only)
Receipt Temp _____ Receipt pH _____

Custody Seal | Present/Absent | Seal | Intact/Not Intact | Seal #'s

RMT LABORATORIES
Madison, WI 53717
744 Heartland Trail
Phone (608) 831-4444
FAX (608) 831-7530
Fox Valley, WI
Columbus, OH
Milwaukee, WI
Nashville, TN
Greenville, SC
Augusta, GA
Lansing, MI
Chicago, IL
Los Angeles, CA
Cincinnati, OH
Madison, WI

F-268 (R2/92)
(Use Black Ink Only)

CHAIN OF CUSTODY RECORD

NO 046800

Bottles Prepared by: DF
Date/Time: 6.7.94

Project No: 2169.17
Client: ASF

Filtered (Yes/No): N N Y Y N N N
Preserved (Code): A C B B D A F

Code: A - None
B - HNO3
C - H_2SO4
D - NaOH
E - HCl
F - 2nAc + NaOH

Lab No.	Yr. 94 Date	Time	Sample Station ID	Total Number Of Containers	Container Inventory: 60 ml pl	40 ml vial	1L pl	500 ml of amb	1L pl	1L pl	1L pl	MATRIX	Comments:
			Temp Blk	1	1								
	—		Trip Blk #29	2	~~[illegible]~~	~~2~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~gw~~	
	6/17	1015	MW-14	12	—	3	1	1	1	1	1	gw	
	6/17	1045	MW-19P	10	—	3	1	1	1	—	—		
	6/17	0755	~~MW-21~~ MW-21	12	—	3	1	1	1	1	1	gw	
	6/17	0753	MW-21 Dup #1	12	—	3	1	1	1	1	1	gw	

SAMPLER	Date/Time	Received by (Sig.)	Date/Time
Relinquished by (Sig.) ① Randall Hulch	6/17/94 1545	② FedEx Shipper Name & # 1769849594	6/17/94 1545
Relinquished by (Sig.) ③		Received by (Sig.) ④ Shipper Name & #	
Relinquished by (Sig.) ⑤		Received by (Sig.) ⑥ Shipper Name & #	

HAZARDS ASSOCIATED WITH SAMPLES

(For Lab Use Only)
Receipt Temp
Receipt pH

Custody Seal Present/Absent Seal Intact/Not Intact Seal #'s

RMT LABORATORIES
Madison, WI 53717
744 Heartland Trail
Phone (608) 831-4444
FAX (608) 831-7530
Fox Valley, WI
Columbus, OH
Milwaukee, WI
Nashville, TN
Greenville, SC
Augusta, GA
Lansing, MI
Chicago, IL
Los Angeles, CA
cinnati, OH
Madison, WI

2 of 2

F-268 (R2/92)
(Use Black Ink Only)

CHAIN OF CUSTODY RECORD

No. 046799

Bottles Prepared by: DF
Date/Time: 6.7.94

Project No.: 216917
Client: ASF

Filtered (Yes/No)
Preserved (Code)

Code: A - None
B - HNO3
C - H_2SO_4
D - NaOH
E - HCl
F - ____

Lab No.	Yr. 94 Date	Time	Sample Station ID	Total Number Of Containers	125ml glamb	125ml pl	1L glamb					MATRIX	Comments:
	6/17	1015	MW-19	Se	1	1	2						
	6/17	1045	MW-19P	Se	1	1	2				0		low volume
	6/17	0755	MW-21	Se	1	1	2						
	6/17	0755	MW-21 Dup #1	Se	1	1	2						
				Se									
				Se									
				1							3		

SAMPLER Relinquished by (Sig.)	Date/Time	Received by (Sig.)	Date/Time
① [signature]	6/17/94 1515	② Fed Ex Shipper Name & # 1769849594	6/17/94 1545
Relinquished by (Sig.) ③	Date/Time	Received by (Sig.) ④ Shipper Name & #	Date/Time
Relinquished by (Sig.) ⑤	Date/Time	Received by (Sig.) ⑥ Shipper Name & #	Date/Time

HAZARDS ASSOCIATED WITH SAMPLES

(For Lab Use Only)
Receipt Temp
Receipt pH

Custody Seal Present/Absent Seal Intact/Not Intact Seal #'s

SEMIANNUAL GROUNDWATER MONITORING RESULTS — MARCH 1995 AMERICAN STEEL FOUNDRIES SEBRING, OHIO

Prepared for

AMERICAN STEEL FOUNDRIES
Chicago, Illinois

Prepared by

ROY F. WESTON, INC.
Three Hawthorn Parkway
Vernon Hills, Illinois 60061

August 1995

Roy F. Weston, Inc.
Suite 400
3 Hawthorn Parkway
Vernon Hills, Illinois 60061-1450
708-918-4000 • Fax 708-918-4055

10 August 1995

Ms. Bernadette Wellman
Manager, Environmental Affairs
American Steel Foundries
10 South Riverside Plaza
10th Floor
Chicago, IL 60606

Work Order No. 10752-005-001

Re: Semiannual Groundwater Sampling and Analysis
American Steel Foundries
Sebring Landfill, Alliance, Ohio

Dear Ms. Wellman:

Roy F. Weston, Inc. (WESTON®) is pleased to submit this report, which details the results of the March 1995 semiannual groundwater sampling of the groundwater monitoring network at the American Steel Foundries, Inc. (ASF) Sebring Landfill (facility) located near Alliance, Ohio. Sampling was completed by WESTON personnel on 21 and 22 March 1995. Laboratory analysis was performed by WESTON Environmental Metrics, Inc. (WESTON EMI) located in University Park, Illinois.

MONITORING PROGRAM DESCRIPTION

The groundwater monitoring network at the facility consists of four upgradient monitoring wells and 11 downgradient compliance monitoring wells. Groundwater occurs in two different hydraulically interconnected stratigraphic units, which constitute one aquifer. Since groundwater chemistry can be quite variable between the two stratigraphic units, independent statistical analyses will be made from wells screened in the bedrock and wells screened in the mine spoils. Table 1 presents a summary of upgradient and downgradient wells that are screened within each of these stratigraphic units. Figure 1 shows the location of each of these monitoring wells.

In accordance with a sampling approach approved by the Ohio Environmental Protection Agency (OEPA) in a 27 April 1995 meeting, the groundwater monitoring program will include the sampling of all monitoring wells on a semiannual basis for the parameters listed in Table 2. It must be noted that this sampling plan was agreed upon subsequent to completion of the March 1995 sampling event. As a result, groundwater samples were analyzed only for those parameters included on the semiannual list presented in the *Proposed Groundwater Monitoring Plan* (RMT, Inc., December, 1994).

The results of the 1995 semiannual groundwater sampling and statistical analysis are presented in the following paragraphs.

ANALYTICAL RESULTS

Groundwater samples collected during the March 1995 sampling event were analyzed for the nine parameters that were included in the semiannual parameter list presented by RMT. These parameters were arsenic, barium, cadmium, cobalt, fluoride, manganese, nickel, zinc, and total phenolics. In addition, pH and specific conductance were measured in the field by sampling personnel. Samples were analyzed by WESTON EMI, and results of these analyses were validated by a WESTON chemist. Table 3 presents a summary of the results of these analyses. The laboratory and data validation reports are presented in Attachment A.

STATISTICAL ANALYSIS

A tolerance interval approach was utilized to compare background monitoring well data to downgradient monitoring well data. Tolerance intervals were calculated from the data collected from the initial four quarters of groundwater sampling (1993 and 1994). In order to increase the statistical base for groundwater occurring in the mine spoils, analytical results obtained for upgradient mine spoils well MW-23 during the March 1995 sampling event were included in the calculation of tolerance intervals. Table 4 presents the upper tolerance level (tolerance interval for pH) to which all downgradient analytical data are compared. If all of the background analytical data for a specific parameter were non-detects, the upper tolerance level was set to two times the detection limit for that parameter.

If the analytical results for a given parameter exceed the upper tolerance level, or tolerance interval for pH, then a statistically significant change in groundwater chemistry may have occurred. A detailed description of the calculation of tolerance intervals will be presented in the *Revised Groundwater Monitoring Plan*, which will subsequently be submitted to OEPA with the final Landfill Closure Plan. This statistical approach has yet to be reviewed by OEPA.

A comparison of the March 1995 analytical results to background tolerance intervals is presented below.

Groundwater Occurring in Bedrock

Comparisons were made between analytical results of groundwater samples collected from wells screened in bedrock and upper tolerance limits calculated from upgradient bedrock monitoring wells MW-1A, MW-14, and MW-19. Table 5 presents a summary of parameters that exceeded upper tolerance levels.

Groundwater Occurring in Mine Spoils

Comparisons were made between analytical results of groundwater samples collected from wells screened in mine spoils and upper tolerance limits calculated from upgradient monitoring well MW-23, which is screened in mine spoils. Table 6 presents a summary of parameters that exceeded upper tolerance levels.

All other parameters were either not detected or were detected at concentrations that were within their respective tolerance intervals.

GROUNDWATER FLOW CONDITIONS

Groundwater elevation data were collected prior to collection of groundwater samples. Table 7 presents a summary of the groundwater measurement data. Results of these measurements were used to construct the groundwater contour map, which is presented as Figure 2. As this map shows, general groundwater flow direction continues to be southwest.

If you have any questions regarding the information contained in this letter, please do not hesitate to contact either of us at (708) 918-4000.

Very truly yours,

ROY F. WESTON, INC.

Gregory S. Kinsall

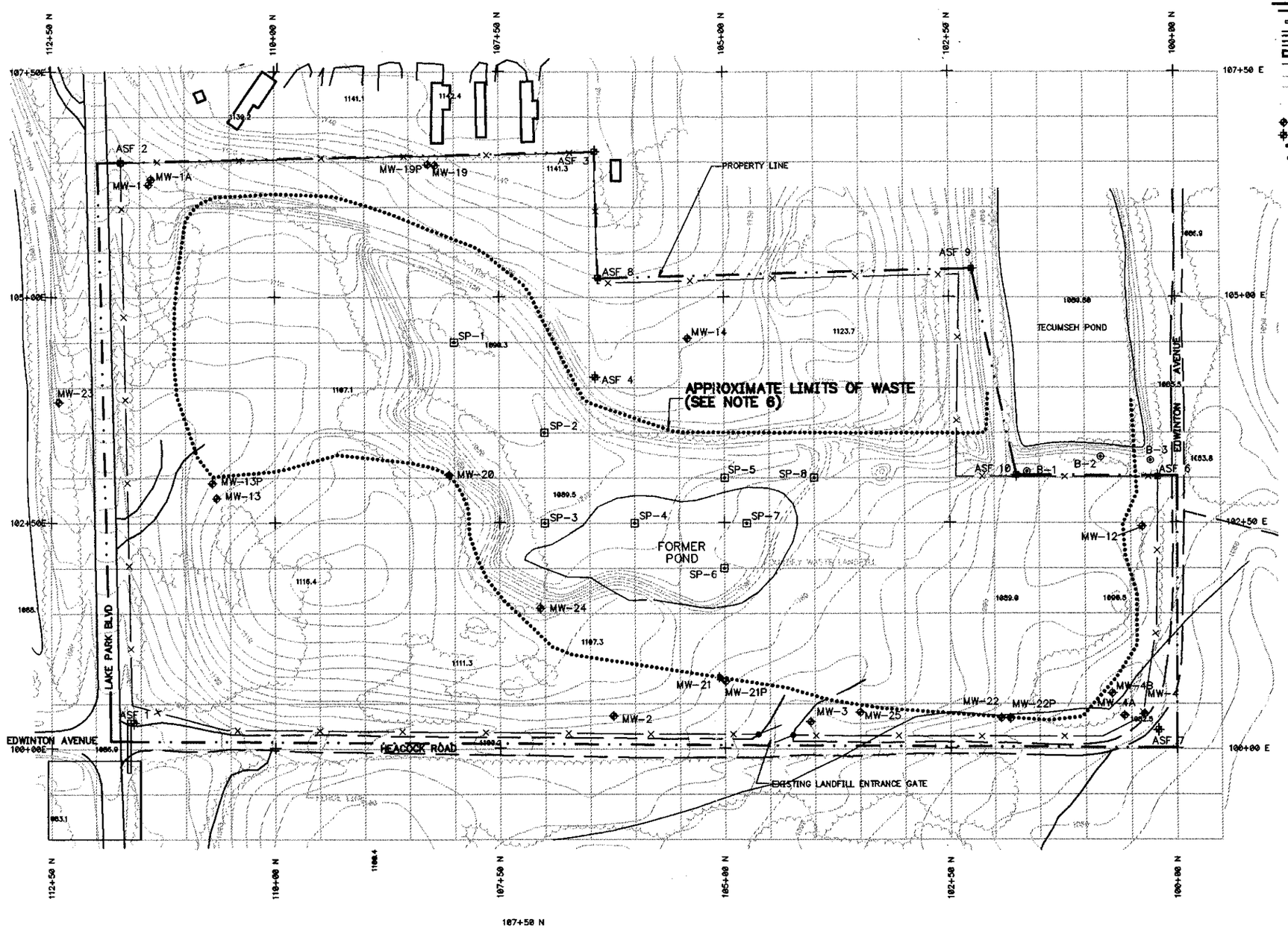
Gregory S. Kinsall, P.G.
Senior Project Geologist

Gary Deigan

Gary J. Deigan
Principal Project Manager

GSK:GJD/slr
Attachments
cc: T. Bradway

CH01\PUBLIC\WO\W10500\17776.LTR



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1089.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 15, 1985 WITH ADDITIONAL SURVEY CONDUCTED IN JUNE 1988.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM KBM INC. OF GRAND FORKS, ND DATE OF PHOTOGRAPHY NOV. 17, 1991.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF 10000N, 10000E.
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE		
MONUMENT NO.	NORTHING	EASTING
ASF 1	11158.33	10027.57
ASF 2	11172.05	10048.05
ASF 3	10543.40	10660.61
ASF 4	10637.30	10400.67
ASF 6	10017.8	10301.5
ASF 7	10020.0	10020.0
ASF 8	10640.20	10520.52
ASF 9	10224.69	10531.12
ASF 10	10175.18	10302.84

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURNSTEIN MONUMENTS.
VERTICAL CONTROL WILL BE ESTABLISED PRIOR TO CONSTRUCTION.

SOURCE MAP:
RMT, INC.

0 125'
SCALE

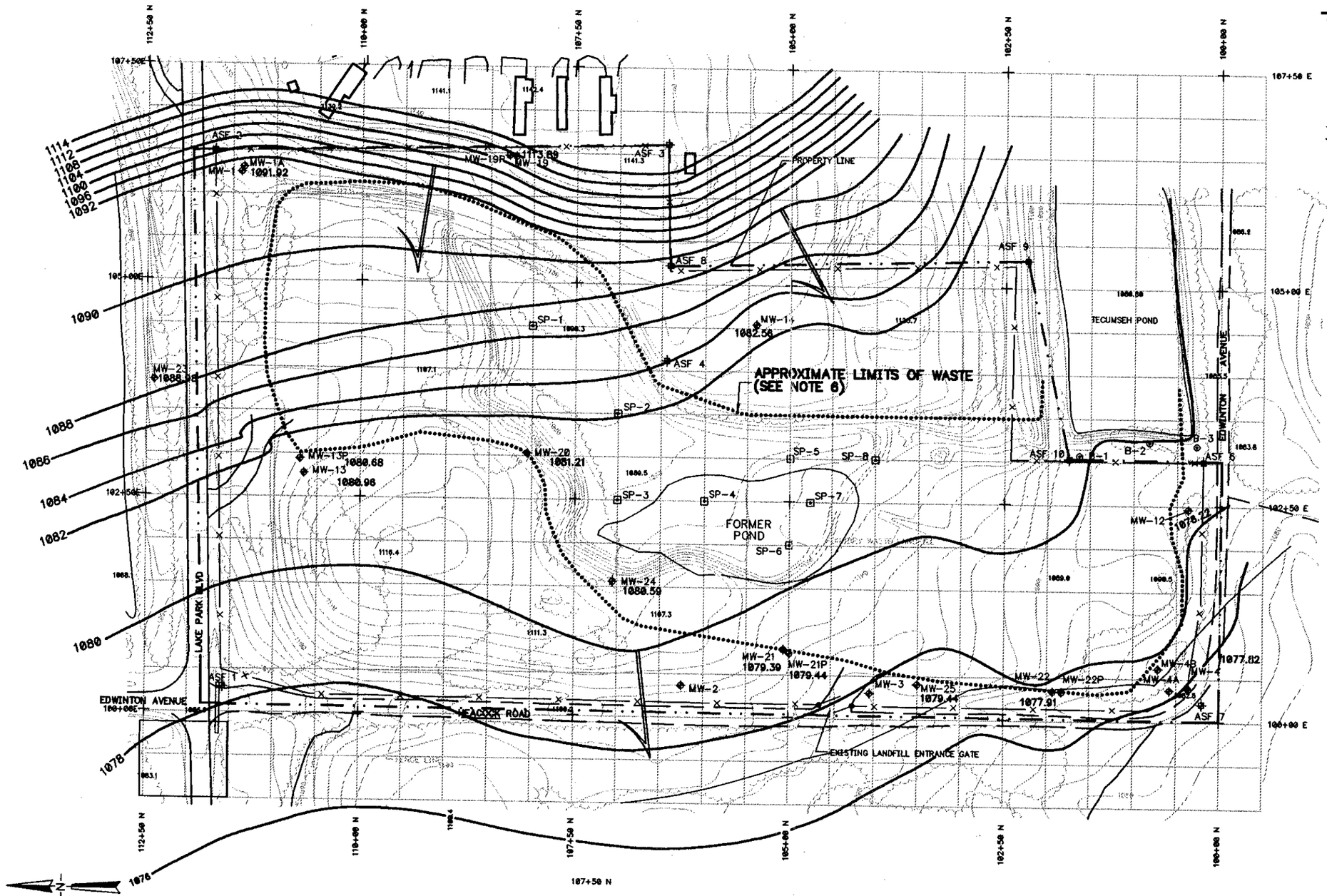
JIM-06/02/95-16:50-J:\CAD93\100\19795

FIGURE 1

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

MONITORING NETWORK LAYOUT
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio



LEGEND

- PROPERTY LINE
- CULVERT
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EXISTING BUILDING
- EXISTING FENCE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 1069.5 EXISTING SPOT ELEVATION
- TREES AND / OR BRUSH
- MW-5 MONITORING WELL LOCATION AND NUMBER
- ASF 2 SURVEY MONUMENT
- APPROXIMATE LIMITS OF WASTE (SEE NOTE 6)
- B-1 BORING LOCATION AND NUMBER
- SETTLEMENT PLATE RISER

NOTES

1. PROPERTY LINE SURVEY OBTAINED FROM HAMMONTREE AND ASSOCIATES, LTD., CANTON-AKRON OHIO. DATE OF SURVEY IS APRIL 15, 1985 WITH ADDITIONAL SURVEY CONDUCTED IN JUNE 1986.
2. TOPOGRAPHIC BASE MAP WAS OBTAINED FROM KBM INC. OF GRAND FORKS, ND DATE OF PHOTOGRAPHY NOV. 17, 1991.
3. THE LIMITS OF WASTE ARE BASED ON INFORMATION PROVIDED BY AMERICAN STEEL FOUNDRIES.
4. CONTOUR INTERVAL IS TWO FEET AND ELEVATIONS ARE REFERENCED TO USGS MEAN SEA LEVEL DATUM.
5. COORDINATE GRID IS SITE SPECIFIC AND IS BASED ON THE SOUTHWEST PROPERTY CORNER (IDENTIFIED BY A 1 /2 " RE-BAR) WHICH HAS THE COORDINATES OF 10000N, 10000E.
6. THE ACTUAL LIMITS OF WASTE WILL BE IDENTIFIED BY EXCAVATION DURING CONSTRUCTION OF THE FINAL COVER. THE FINAL COVER WILL BE ADJUSTED ACCORDINGLY TO EXTEND BEYOND THE LIMITS OF WASTE BY A MINIMUM OF 10 FEET AROUND THE ENTIRE LANDFILL UNLESS PROPERTY BOUNDARIES WILL NOT ALLOW.

SURVEY MONUMENT COORDINATE TABLE

MONUMENT NO.	NORTHING	EASTING
ASF 1	11156.33	10027.57
ASF 2	11172.95	10048.05
ASF 3	10843.46	10060.01
ASF 4	10637.30	10480.07
ASF 5	10017.8	10301.5
ASF 7	10020.0	10020.0
ASF 8	10040.20	10036.52
ASF 9	10224.08	10031.12
ASF 10	10175.10	10302.64

NOTE: ASF 9 MONUMENT IS A 3/4 " ALUMINUM PIPE w/CAP SET. ALL OTHER ASF POINTS ARE METAL BURNSTEIN MONUMENTS. VERTICAL CONTROL WILL BE ESTABLISHED PRIOR TO CONSTRUCTION.

SOURCE MAP:
RMT, INC.

JIM-06/02/95-16:50-J:\CAD93\100\19795

FIGURE 2

WESTON
MANAGERS DESIGNERS/CONSULTANTS

Three Hawthorn Parkway
Vernon Hills, Illinois
60061

GROUNDWATER FLOW MAP
SEBRING FACILITY
AMERICAN STEEL FOUNDRIES
Alliance, Ohio

Table 1

Groundwater Monitoring Network
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Wells Screened in Bedrock	
Well I.D.	Well Position
MW-1A	Upgradient
MW-14	Upgradient
MW-19	Upgradient
MW-13P	Downgradient
MW-20	Downgradient
MW-21P	Downgradient
MW-22P	Downgradient
MW-24	Downgradient

Wells Screened in Mine Spoils	
Well I.D.	Well Position
MW-23	Upgradient
MW-4B	Downgradient
MW-12	Downgradient
MW-13	Downgradient
MW-21	Downgradient
MW-22	Downgradient
MW-25	Downgradient

Table 2

Sampling and Analysis Program
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Parameter	Sampling Frequency
Arsenic	Semiannually
Barium	Semiannually
Cadmium	Semiannually
Chromium	Semiannually
Cobalt	Semiannually
Fluoride	Semiannually
Iron	Semiannually
Lead	Semiannually
Manganese	Semiannually
Mercury	Semiannually
Nickel	Semiannually
Selenium	Seminannually
Silver	Semiannually
Zinc	Semiannually
Chloride	Semiannually
Sulfate	Semiannually
Total phenolics	Semiannually
pH*	Semiannually
Specific Conductance*	Semiannaully

*Field measured.

Table 3

Summary of Groundwater Sample Analytical Results March 1995 American Steel Foundries Sebring Landfill Alliance, Ohio

Parameter	MW-1A	MW-4B	MW-12	MW-13	MW-13P	MW-14	MW-19	MW-20	MW-20 DP	MW-21
Arsenic	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.0023
Barium	0.095 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Cadmium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Cobalt	0.02 U	0.02 U	0.02 U	0.12	0.19	0.02 U	0.02 U	0.021	0.022	0.02 U
Fluoride	0.81 U	0.24 U	0.61 U	0.78 U	0.80 U	0.35 U	0.10 U	0.47 U	0.48 U	0.70 U
Iron	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Lead	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Manganese	1.1	6.5	5.1	10.8	18.3	0.57	0.35	10.1	10.1	10.4
Mercury	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	0.047	0.02 U	0.02 U	0.18	0.31	0.02 U	0.02 U	0.022	0.029	0.02 U
Selenium	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	0.075	0.019	0.01 U	0.32	0.46	0.01 U	0.01 U	0.01 U	0.011	0.011
Chloride	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Sulfate	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Total phenolics	0.005 U	0.02	0.005 U	0.005 U	0.0050	0.052	0.016	0.006 U	0.0091	0.005 U
pH	5.9	7.5	7.6	5.4	3.8	NC	7.0	6.7	6.7	7.0
Specific conductance	2,270	1,330	1,570	1,950	1,600	NC	2,300	2,400	2,400	3,450

Table 3

Summary of Groundwater Sample Analytical Results March 1995 American Steel Foundries Sebring Landfill Alliance, Ohio (Continued)

Parameter	MW-21 P	MW-22	MW-22 P	MW-23	MW-24	MW-25	MW-22 DP
Arsenic	0.002 U	0.002	0.0029	0.002 U	0.002 U	0.0049	0.002 U
Barium	0.083	0.05 U	0.19	0.05 U	0.05 U	0.05 U	0.05 U
Cadmium	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chromium	NC	NC	NC	NC	NC	NC	NC
Cobalt	0.02 U	0.02 U	0.02 U	0.02	0.22	0.04	0.02 U
Fluoride	2.8	0.70 U	10.1	0.15 J	0.14 U	0.47 U	0.69 U
Iron	NC	NC	NC	NC	NC	NC	NC
Lead	NC	NC	NC	NC	NC	NC	NC
Manganese	0.098	5.5	0.014	4.3	66.4	11.1	5.4
Mercury	NC	NC	NC	NC	NC	NC	NC
Nickel	0.02 U	0.02 U	0.02 U	0.036	0.061	0.029	0.023
Selenium	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC
Zinc	0.013	0.014	0.01 U	0.064	0.020	0.032	0.014
Chloride	NC	NC	NC	NC	NC	NC	NC
Sulfate	NC	NC	NC	NC	NC	NC	NC
Total phenolics	0.005 U	0.038	0.005 U	0.005 U	0.028	0.005 U	0.005 U
pH	NC	7.7	7.9	6.8	5.9	6.8	7.7
Specific conductance	NC	1,580	2,850	1,350	3,920	3,890	1,580

0.01 U - Undetected at a detection limit of 0.01 mg/L.
NC - Not collected.
Analytical results reported as mg/L.
pH reported as standard units (S.U.).
Specific conductance reported as umhos/cm.

Table 4

Summary of Upper Tolerance Levels
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Parameter	Bedrock Monitoring Wells (mg/L)	Mine Spoils Monitoring Wells (mg/L)
Arsenic	0.006	0.006
Barium	0.10	0.10
Cadmium	0.0036	0.012
Cobalt	0.048	0.10
Chromium	0.03	0.004
Fluoride	1.65	0.326
Iron	36.6	24.0
Lead	0.006	0.006
Manganese	3.1	6.63
Mercury	0.0004	0.0004
Nickel	0.095	0.080
Selenium	0.08	0.006
Silver	0.002	0.002
Zinc	0.2	0.137
Chloride	349.45	411.1
Sulfate	13,886.5	1,741.2
Total phenolics	0.26	
pH*	0.96/10.1	4.61/8.35
Specific conductance**	3,072	2,135

NA - Not applicable.
* - pH has lower/upper tolerance levels, reported in standard units (S.U.).
** - Specific conductance is reported in μmhos/cm.

Table 5

Summary of Analytical Results Exceeding Upper Tolerance Levels — Bedrock Wells American Steel Foundries Sebring Landfill Alliance, Ohio

Parameter	Upper Tolerance Level (mg/L)	MW-13P (mg/L)	MW-20 (mg/L)	MW-21P (mg/L)	MW-22P (mg/L)	MW-24 (mg/L)
Barium	0.1				0.19	
Cobalt	0.048	0.19				0.22
Fluoride	1.65			2.8	10.1	
Manganese	3.1	18.3	10.1			66.4
Nickel	0.095	0.31				
Zinc	0.2	0.46				
Specific Conductance*	3,072					3,920

*Specific conductance reported in μmhos/cm.

Table 6

Summary of Analytical Results Exceeding Upper Tolerance Levels — Mine Spoils Wells American Steel Foundries Sebring Landfill Alliance, Ohio

Parameter	Upper Tolerance Level (mg/L)	MW-13 (mg/L)	MW-21 (mg/L)	MW-25 (mg/L)
Cobalt	0.10	0.12		
Manganese	6.63	10.8	10.4	11.1
Nickel	0.08	0.18		
Zinc	0.137	0.32		
Specific Conductance*	2,135		3,450	3,890

*Specific conductance reported in μmhos/cm.

Table 7

Groundwater Elevation Data
March 1995
American Steel Foundries
Sebring Landfill
Alliance, Ohio

Well I.D.	Top of Casing Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
MW-1A	1,126.09	34.17	1,091.92
MW-4B	1,085.76	7.94	1,077.82
MW-12	1,087.94	9.72	1,078.22
MW-13	1,107.70	26.74	1,080.96
MW-13P	1,106.80	26.12	1,080.68
MW-14	1,131.18	48.62	1,082.56
MW-19	1,141.16	27.27	1,113.89
MW-20	1,113.21	32.00	1,081.21
MW-21	1,101.12	21.73	1,079.39
MW-21P	1,101.12	21.68	1,079.44
MW-22	1,091.01	13.10	1,077.91
MW-22P	1,091.23	19.43	1,071.80
MW-23	1,107.81	18.83	1,088.98
MW-24	1,110.96	30.37	1,080.59
MW-25	1,095.39	18.00	1,077.31

ATTACHMENT A

LABORATORY ANALYTICAL REPORT

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET 1 of 2

CLIENT/SUBJECT ASP W.O. NO. 10752-005-001

TASK DESCRIPTION Data Validation - Groundwater TASK NO.

PREPARED BY Steve DEPT S3S DATE 4/

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

Fluoride + Total Phenolics

Holding Times: Acceptable

Duplicate: Fluoride RD was ok. Total phenolics show a high RD but there is no qualification for this type of analysis.

Field Blanks: Show a detection of Fluoride in the Blank. Any sample >1 DL but <5x the Blank will be qualified "U"

0.26 x 5 = 1.30 mg/L

The following have been "U"

MW-14-01, MW-20-01, MW-20-01DP, MW-4B-01, MW-23-01
MW-13-01, MW-13P-01, MW-24-01, MW-25-01
MW-21-01, MW-22-01, MW-22-01DP, MW-12-01, MW-1A-01

Method Blank: Acceptable

Replicate: Acceptable

Spike Acceptable

LCS: Acceptable

RFW 10-05-003/A-5/85
512-5643

WESTON
MANAGERS DESIGNERS/CONSULTANTS

SHEET 2 of 2

CLIENT/SUBJECT ASF W.O. NO. 10752-005-001

TASK DESCRIPTION Groundwater Data Validation TASK NO.

PREPARED BY Stan DEPT 535 DATE 9/23/95

MATH CHECK BY DEPT DATE

METHOD REV. BY DEPT DATE

APPROVED BY

DEPT DATE

Metals, Soluble

Holding Time → Acceptable

Duplicate: Acceptable

Field Blank: Acceptable

Spike: Acceptable

Metals Good!

RFW 10-05-003/A-5/85
512-5643

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
® 708-534-5200 • Fax 708-534-5211

MANAGERS DESIGNERS/CONSULTANTS

30 March 1995

Mr. Greg Kinsall
Roy F. Weston, Inc.
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

RE: American Steel Foundries
RFW Lot 9503G902

Dear Mr. Kinsall:

Enclosed is the Analytical Report for the Project and RFW Lot Number listed above. If you have any questions, please contact me at 708-534-5200.

Very truly yours,

Weston Environmental Metrics, Inc.

Jane D. Huber

Jane D. Huber
Project Manager

km

Enclosures

Approved By:

Michael J. Healy

Michael J. Healy
Vice President/Laboratory Manager

The results presented in this report relate only to the analytical testing and conditions of sample at receipt. This report pertains to only those samples actually tested. All 57 pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-19-01							
FLUORIDE	001	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	001	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-14-01							
FLUORIDE	002	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	002	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-20-01							
FLUORIDE	003	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	003	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-20-01DP							
FLUORIDE	004	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	004	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-4B-01							
FLUORIDE	005	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	005	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-13-01							
FLUORIDE	006	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	006	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-13P-01							
FLUORIDE	007	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	007	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-24-01							
FLUORIDE	008	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	008	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-25-01							
FLUORIDE	009	W	95GFL014	03/21/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	009	W	95GPE016	03/21/95	03/23/95	03/27/95	03/28/95
MW-21P-01							
FLUORIDE	010	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	010	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
MW-21-01							
FLUORIDE	011	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	011	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
MW-22-01							
FLUORIDE	012	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	012	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
MW-22-01DP							
FLUORIDE	013	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	013	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
MW-22P-01							
FLUORIDE	014	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	014	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
MW-12-01							
FLUORIDE	015	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	015	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
MW-1A-01							
FLUORIDE	016	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	016	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
PHENOLICS	016 REP	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
MW-23-01							
FLUORIDE	017	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
FLUORIDE	017 REP	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
FLUORIDE	017 MS	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	017	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
FB-01-01							
FLUORIDE	018	W	95GFL014	03/22/95	03/23/95	03/27/95	03/27/95
TOTAL PHENOLICS	018	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95
PHENOLICS	018 MS	W	95GPE016	03/22/95	03/23/95	03/27/95	03/28/95

LAB QC:

FLUORIDE	LCS BS	W	95GFL014	N/A	N/A	03/27/95	03/27/95
FLUORIDE	LCS BSD	W	95GFL014	N/A	N/A	03/27/95	03/27/95
FLUORIDE	MB1	W	95GFL014	N/A	N/A	03/27/95	03/27/95
PHENOLICS	LCS BS	W	95GPE016	N/A	N/A	03/27/95	03/28/95
PHENOLICS	LCS BSD	W	95GPE016	N/A	N/A	03/27/95	03/28/95
TOTAL PHENOLICS	MB1	W	95GPE016	N/A	N/A	03/27/95	03/28/95

IGNATURE Diane L. Harper DATE 3/29/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-19-01
Project # 00000-000-000-0000
Lab ID: 9503G902-001
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Fluoride	0.10	u	mg/L	0.10
Total Phenolics	0.016		mg/L	0.0060

PS
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-14-01
Project # 00000-000-000-0000
Lab ID: 9503G902-002
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.35 u	mg/L	0.10
Total Phenolics	0.052	mg/L	0.0060

PL
7-25-95

Weston Environmental Metrics, Inc.
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University Park, Illinois 60466-3182
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-20-01
Project # 00000-000-000-0000
Lab ID: 9503G902-003
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.47 u	mg/L	0.10
Total Phenolics	0.0060 u	mg/L	0.0060

PS 4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-20-01DP
Project # 00000-000-000-0000
Lab ID: 9503G902-004
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Fluoride	0.48	U	mg/L	0.10
Total Phenolics	0.0091		mg/L	0.0060

RR 4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-4B-01
Project # 00000-000-000-0000
Lab ID: 9503G902-005
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.24 U	mg/L	0.10
Total Phenolics	0.020	mg/L	0.0060

RR
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-13-01
Project # 00000-000-000-0000
Lab ID: 9503G902-006
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Fluoride	0.78	u	mg/L	0.10
Total Phenolics	0.0050	u	mg/L	0.0050

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-13P-01
Project # 00000-000-000-0000
Lab ID: 9503G902-007
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.80 u	mg/L	0.10
Total Phenolics	0.0050	mg/L	0.0050

M
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-24-01
Project # 00000-000-000-0000
Lab ID: 9503G902-008
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.14 U	mg/L	0.10
Total Phenolics	0.028	mg/L	0.0050

PH
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-25-01
Project # 00000-000-000-0000
Lab ID: 9503G902-009
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.47 u	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050

M
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-21P-01
Project # 00000-000-000-0000
Lab ID: 9503G902-010
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	2.8	mg/L	0.20
Total Phenolics	0.0050 u	mg/L	0.0050

AR
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-21-01
Project # 00000-000-000-0000
Lab ID: 9503G902-011
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.70 u	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050

PA
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-22-01
Project # 00000-000-000-0000
Lab ID: 9503G902-012
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.70 U	mg/L	0.10
Total Phenolics	0.038	mg/L	0.0050

RB
4-25-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-22-01DP
Project # 00000-000-000-0000
Lab ID: 9503G902-013
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.69 u	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050

R 4-25-95

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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-22P-01
Project # 00000-000-000-0000
Lab ID: 9503G902-014
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	10.1	mg/L	2.5
Total Phenolics	0.0050 u	mg/L	0.0050

RF
4-25-95

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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-12-01
Project # 00000-000-000-0000
Lab ID: 9503G902-015
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.61 u	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050

PL
4-25-95

Weston Environmental Metrics, Inc.
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University Park, Illinois 60466-3182
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-1A-01
Project # 00000-000-000-0000
Lab ID: 9503G902-016
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.81 u	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050

R 4-27-95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: MW-23-01
Project # 00000-000-000-0000
Lab ID: 9503G902-017
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.15 u	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050

PB 4-25-95

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Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

RE: FB-01-01
Project # 00000-000-000-0000
Lab ID: 9503G902-018
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Fluoride	0.26	mg/L	0.10
Total Phenolics	0.0050 u	mg/L	0.0050

4.25.95

Weston Environmental Metrics, Inc.
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

Project # 00000-000-000-0000
Lab Batch: 9503G902

Inorganic Method Blank Data Report

Sample	Lab ID	Parameter	Result		Units	Reporting Limit
Blank 1	95GFL014-MB1	Fluoride	0.10	u	mg/L	0.10
Blank 1	95GPE016-MB1	Total Phenolics	0.0050	u	mg/L	0.0050

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4-25-95

Weston Environmental Metrics, Inc.
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

Project # 00000-000-000-0000
Lab Batch: 9503G902

Inorganic Precision Data Report

Sample	Site ID	Parameter	Initial Result	Replicate	RPD
-016REP	MW-1A-01	Phenolics	0.0050 u	0.0050 u	NC
-017REP	MW-23-01	Fluoride	0.15	0.16	3.1

pl
4-25-95

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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

Project # 00000-000-000-0000
Lab Batch: 9503G902

Inorganic Accuracy Data Report

Sample	Site ID	Parameter	Spiked Sample	Initial Result	Spiked Amount	% Recov
-017	MW-23-01	Fluoride	1.2	0.15	1.0	100
-018	FB-01-01	Phenolics	0.053	0.0050 u	0.050	106

ae
4-25-95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Wednesday March 29th, 1995

Project # 00000-000-000-0000
Lab Batch: 9503G902

Inorganic Laboratory Control Standards Report

Lab ID	Parameter	Spiked Amount	Units	Spike #1 % Recov.	Spike #2 % Recov.	RPD
95GFL014-LCS	Fluoride	1.0	mg/L	96.6	99.6	3.1
95GPE016-LCS	Phenolics	0.10	mg/L	93.2	101	8.2

A 4-25-95

Weston Environmental Metrics, Inc. Method Reference

The following methods are used as reference for the analysis of samples contained within this RFW Lot:

Wet Chemistry Methods

% Ash	___SM 2540G
	___ASTM D-3174
	___ASTM D-482
% Water Karl Fisher	___ASTM D-4377-84
% Water Dean Stark	___ASTM D-95-83
% Moisture	___SM 2540G
% Solids	___SM 2540G
% Volatiles	___SM 2540G
Acidity	___EPA 305.1
	___SM 2310B
Alkalinity	___EPA 310.1
	___EPA 310.2
	___SM 2320B
Ammonia (Dist./Nesslers)	
	___EPA 350.2
	___SM4500-NH_3C
BOD	___EPA 405.1
	___SM 5210B
Bottom Sed & Water	___ASTM D-4007
BTU	___ASTM D-240
Bromide	___EPA 320.1
	___EPA 300.0
Bromine	___EPA 320.1 after bomb
COD High	___HACH 8000
COD Low	___HACH 8000
Chloride	___EPA 325.2
	___EPA 325.3
	___EPA 300.0
	___SM 4500-Cl-E
Chlorine (O_2 Bomb)	___ASTM D-808, mod
Chlorine, Residual	___EPA 330.4
	___SM 4500-ClC
Chromium VI	___SM 3500-CrD
	___SW846 7196
	_____
Color	___EPA 110.2
	___SM 2120B
Corrosivity, pH	___EPA 150.1
	___SW846 9040
	___SW846 9045
Corrosivity, Langlier	___SM 2330A+B

Cyanide, Amenable	___EPA 335.1
	___SW846 9010A
	___SM 4500-CNG
Cyanide, Free	_____
Cyanide, Reactive	___SW846 7.3.3.2
Cyanide, Total	___EPA 335.2
	___SW846 9010A
	___SM 4500-CNC
	___ILM03.0
Density/Specific Gravity	___SM 2710F
	___ASTM D-1298
Extractable Organic Halogens	___Dohrmann Method
Flashpoint	___SW846 1010
	___ASTM D93
	___ASTM D92
Fluoride	✓EPA 340.2
	___SM 4500-F-C
Fluorine	___ASTM 3761, mod
Hardness	___SM 2340 B
Heavy Metals	___USP 231
Ignitability	___SW846 Section 7
Iodide (Titrimetric)	___EPA 345.1
MBAS (Surfactants)	___EPA 425.1
	___SM 5540 C
Nitrate/Nitrite	___EPA 353.2
	___EPA 300.0
	___SM 4500-NO_3-F
Nitrate	___EPA 353.2
	___EPA 300.0
	___SM 4500-NO3-F
Nitrite	___EPA 354.1
	___EPA 353.2
	___EPA 300.0
	___SM 4500-NO_2-B
Odor	___EPA 140.1
	___SM 2150B
Oil & Grease, Grav.	___EPA 413.1
	___SM 5520B
	___SW846 9070
Oil & Grease, IR	___EPA 413.2
	___SM 5520C

Weston Environmental Metrics, Inc. Method Reference, cont.

The following methods are used as reference for the analysis of samples contained within this RFW Lot:

Oil & Grease, Soxhlet	___SW846 9071
	___SM 5520D
Paint Filters (Free Liquid)	___SW846 9095
Petroleum Hydrocarbons	___EPA 418.1
pH, Water	___SW 9041A
	___EPA 150.1
	___SM 4500-H^+B
	___SW846 9040A
pH, Soil	___SW846 9045
Phenol	✓EPA 420.2
	___SW846 9066
	___EPA 420.1
	___SM 5530C
Orthophosphate as P	___EPA 365.2
	___SM 4500PE
Phosphorus, as P	___EPA 365.2
	___EPA 365.4
	___SM 4500PE
ROE at 180°C	___EPA 160.1, mod
	___SM 2540C, mod
Settleable Solid	___EPA 160.5
	___SM 2540F
Soluble Organic Carbon	___EPA 415.1
	___SM 5310C
Specific Conductance	___EPA 120.1
	___SM 2510B
Sulfate (Turbidimetric)	___EPA 375.4
	___SW846 9038
	___SM 4500-SO_4^{-2}E
Sulfide (Titrimetric)	___EPA 376.1
	___SM 4500-S^{2-}E
	___SW846 9030A, mod
Sulfide, Reactive	___SW846 7.3.4.2
Sulfite	___EPA 377.1
	___SM 4500-SO_3^{2-}B

Sulfur	___ASTM 129
	___EPA 375.4
	(SO4) after bombing
TDS	___EPA 160.1
	___SM 2540C
Total Inorganic Carbon	___EPA 415.1
	___SM 5310C
TKN	___EPA 351.3
	___SM 4500-N_{org}C
TOC	___EPA 415.1
	___SM 5310C
	___SW8469060-Quads
TOX	___SW846 9020A
	___SM 5320B
TOX on Waste	___ ASTM D-808
	and EPA 325.3
Total Solids	___EPA 160.3
	___SM 2540B
TSS	___EPA 160.2
	___SM 2540D
TVS	___EPA 160.4
	___SM 2540E
Turbidity	___EPA 180.1
	___SM 2130B
Viscosity, Brookfield	___ASTM D2983
Viscosity, Kinematic	___ASTM D445
Volatile Dissolved Solids	___EPA 160.4
	___SM 2540E
Volatile Suspended Solids	___EPA 160.4
	___SM 2540E

_____
_____
_____
_____
_____

	<u>Microbiological</u>
Heterotrophic Plate Count	__SM 907A
Fecal Coliform	__SM 909C

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-19-01							
ARSENIC, SOLUBLE	001	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	001	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	001	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	001	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	001	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	001	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	001	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MW-14-01							
ARSENIC, SOLUBLE	002	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	002	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	002	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	002	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	002	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	002	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	002	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MW-20-01							
ARSENIC, SOLUBLE	003	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	003	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	003	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	003	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	003	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	003	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	003	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MW-20-01DP							
ARSENIC, SOLUBLE	004	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	004	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	004	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	004	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	004	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	004	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	004	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
MW-4B-01							
ARSENIC, SOLUBLE	005	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	005	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	005	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	005	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	005	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	005	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	005	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MW-13-01							
ARSENIC, SOLUBLE	006	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ARSENIC, SOLUBLE	006 REP	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ARSENIC, SOLUBLE	006 MS	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	006	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	006	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	006	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	006	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	006	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	006	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MW-13P-01							
ARSENIC, SOLUBLE	007	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	007	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	007	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	007	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	007	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	007	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	007	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MW-24-01							
ARSENIC, SOLUBLE	008	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	008	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	008	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	008	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	008	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
NICKEL, SOLUBLE	008	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	008	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-25-01							
ARSENIC, SOLUBLE	009	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	009	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	009	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	009	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	009	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	009	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	009	W	NONE	03/21/95	03/23/95	03/27/95	03/27/95
MW-21P-01							
ARSENIC, SOLUBLE	010	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	010	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	010	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	010	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	010	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	010	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	010	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-21-01							
ARSENIC, SOLUBLE	011	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	011	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	011	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	011	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	011	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	011	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	011	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-22-01							
ARSENIC, SOLUBLE	012	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	012	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	012	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	012	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	012	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95

NY CERTIFICATION # 11006

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INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
NICKEL, SOLUBLE	012	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	012	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-22-01DP							
ARSENIC, SOLUBLE	013	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	013	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	013	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	013	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	013	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	013	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	013	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-22P-01							
ARSENIC, SOLUBLE	014	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	014	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	014	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	014	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	014	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	014	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	014	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-12-01							
ARSENIC, SOLUBLE	015	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	015	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	015	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	015	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	015	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	015	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	015	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-1A-01							
ARSENIC, SOLUBLE	016	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	016	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	016	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	016	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	016	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
American Steel Foundries

LABORATORY CHRONICLE

RFW LOT # :9503G902

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
NICKEL, SOLUBLE	016	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	016	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MW-23-01							
ARSENIC, SOLUBLE	017	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	017	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	017	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	017	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	017	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	017	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	017	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
FB-01-01							
ARSENIC, SOLUBLE	018	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
BARIUM, SOLUBLE	018	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
CADMIUM, SOLUBLE	018	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
COBALT, SOLUBLE	018	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
MANGANESE, SOLUBLE	018	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
NICKEL, SOLUBLE	018	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95
ZINC, SOLUBLE	018	W	NONE	03/22/95	03/23/95	03/27/95	03/27/95

SIGNATURE [signature] DATE 3/30/95

NY CERTIFICATION # 11006

Weston Environmental Metrics, Inc.
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-19-01
Project # 00000-000-000-0000
Lab ID: 9503G902-001
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	0.35		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.010	u	mg/L	0.010

PB
4/25/98

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-14-01
Project # 00000-000-000-0000
Lab ID: 9503G902-002
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	0.57		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.010	u	mg/L	0.010

4/26/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-20-01
Project # 00000-000-000-0000
Lab ID: 9503G902-003
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.021		mg/L	0.020
Manganese, Soluble	10.1		mg/L	0.010
Nickel, Soluble	0.022		mg/L	0.020
Zinc, Soluble	0.010	u	mg/L	0.010

4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-20-01DP
Project # 00000-000-000-0000
Lab ID: 9503G902-004
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.022		mg/L	0.020
Manganese, Soluble	10.1		mg/L	0.010
Nickel, Soluble	0.029		mg/L	0.020
Zinc, Soluble	0.011		mg/L	0.010

SY
4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-4B-01
Project # 00000-000-000-0000
Lab ID: 9503G902-005
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	6.5		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.019		mg/L	0.010

4/25/95

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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-13-01
Project # 00000-000-000-0000
Lab ID: 9503G902-006
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.12	mg/L	0.020
Manganese, Soluble	10.8	mg/L	0.010
Nickel, Soluble	0.18	mg/L	0.020
Zinc, Soluble	0.32	mg/L	0.010

fc
4/25/95

Weston Environmental Metrics, Inc.
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-13P-01
Project # 00000-000-000-0000
Lab ID: 9503G902-007
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.19	mg/L	0.020
Manganese, Soluble	18.3	mg/L	0.010
Nickel, Soluble	0.31	mg/L	0.020
Zinc, Soluble	0.46	mg/L	0.010

GK
4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-24-01
Project # 00000-000-000-0000
Lab ID: 9503G902-008
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.22	mg/L	0.020
Manganese, Soluble	66.4	mg/L	0.010
Nickel, Soluble	0.061	mg/L	0.020
Zinc, Soluble	0.020	mg/L	0.010

4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-25-01
Project # 00000-000-000-0000
Lab ID: 9503G902-009
Sample Date: 03/21/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0049		mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.040		mg/L	0.020
Manganese, Soluble	11.1		mg/L	0.010
Nickel, Soluble	0.029		mg/L	0.020
Zinc, Soluble	0.032		mg/L	0.010

4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-21P-01
Project # 00000-000-000-0000
Lab ID: 9503G902-010
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.083	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.020 u	mg/L	0.020
Manganese, Soluble	0.098	mg/L	0.010
Nickel, Soluble	0.020 u	mg/L	0.020
Zinc, Soluble	0.013	mg/L	0.010

PS
4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-21-01
Project # 00000-000-000-0000
Lab ID: 9503G902-011
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0023		mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	10.4		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.011		mg/L	0.010

GI
4/25/95

Weston Environmental Metrics, Inc.
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Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-22-01
Project # 00000-000-000-0000
Lab ID: 9503G902-012
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020		mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	5.5		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.014		mg/L	0.010

RF 4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-22-01DP
Project # 00000-000-000-0000
Lab ID: 9503G902-013
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.020 u	mg/L	0.020
Manganese, Soluble	5.4	mg/L	0.010
Nickel, Soluble	0.023	mg/L	0.020
Zinc, Soluble	0.014	mg/L	0.010

M 4/25/95

Weston Environmental Metrics, Inc.
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To: **American Steel Foundries**
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: **Mr. Greg Kinsall**

Date: Thursday March 30th, 1995

RE: **MW-22P-01**
Project # 00000-000-000-0000
Lab ID: **9503G902-014**
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0029		mg/L	0.0020
Barium, Soluble	0.19		mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	0.014		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.010	u	mg/L	0.010

4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-12-01
Project # 00000-000-000-0000
Lab ID: 9503G902-015
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	5.1		mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.010	u	mg/L	0.010

PB
4/25/95

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To: **American Steel Foundries**
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: **Mr. Greg Kinsall**

Date: Thursday March 30th, 1995

RE: **MW-1A-01**
Project # 00000-000-000-0000
Lab ID: **9503G902-016**
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	1.1		mg/L	0.010
Nickel, Soluble	0.047		mg/L	0.020
Zinc, Soluble	0.075		mg/L	0.010

RS
4/25/95

Weston Environmental Metrics, Inc.
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To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: MW-23-01
Project # 00000-000-000-0000
Lab ID: 9503G902-017
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result	Units	Reporting Limit
Arsenic, Soluble	0.0020 u	mg/L	0.0020
Barium, Soluble	0.050 u	mg/L	0.050
Cadmium, Soluble	0.010 u	mg/L	0.010
Cobalt, Soluble	0.020	mg/L	0.020
Manganese, Soluble	4.3	mg/L	0.010
Nickel, Soluble	0.036	mg/L	0.020
Zinc, Soluble	0.064	mg/L	0.010

4/25/95

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To: American Steel Foundries
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3 Hawthorn Parkway, Suite 400
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Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

RE: FB-01-01
Project # 00000-000-000-0000
Lab ID: 9503G902-018
Sample Date: 03/22/95
Date Received: 03/23/95

Inorganic Data Report

Parameters	Result		Units	Reporting Limit
Arsenic, Soluble	0.0020	u	mg/L	0.0020
Barium, Soluble	0.050	u	mg/L	0.050
Cadmium, Soluble	0.010	u	mg/L	0.010
Cobalt, Soluble	0.020	u	mg/L	0.020
Manganese, Soluble	0.010	u	mg/L	0.010
Nickel, Soluble	0.020	u	mg/L	0.020
Zinc, Soluble	0.010	u	mg/L	0.010

PR
4/25/95

Weston Environmental Metrics, Inc.
2417 Bond Street
University Park, Illinois 60466-3182
Phones: (708) 534-5200 (219) 885-7077 (815) 723-7533
Fax: (708) 534-5211

To: American Steel Foundries
Roy F. Weston, Incorporated
3 Hawthorn Parkway, Suite 400
Vernon Hills, IL 60061-1450

Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

Project # 00000-000-000-0000
Lab Batch: 9503G902

Inorganic Precision Data Report

Sample	Site ID	Parameter	Initial Result	Replicate	RPD
-006REP	MW-13-01	Arsenic, Soluble	0.0020 u	0.0020 u	NC

4/25/95

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Attn: Mr. Greg Kinsall

Date: Thursday March 30th, 1995

Project # 00000-000-000-0000
Lab Batch: 9503G902

Inorganic Accuracy Data Report

Sample	Site ID	Parameter	Spiked Sample	Initial Result	Spiked Amount	% Recov
-006	MW-13-01	Arsenic, Soluble	0.019	0.0020 u	0.020	94.8

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7/25/95

Weston Environmental Metrics, Inc. Method Reference

The following methods are used as reference for the analysis of samples contained within this RFW Lot: 9503G902

Metals Methods

CLP Procedures	___SOW 7/88	___ILM02.1	___ILM03.0	
Aluminum	___SW846 6010	___EPA 200.7		
Antimony	___SW846 6010	___EPA 200.7	___SW846 7041	___EPA 204.2
Arsenic	___SW846 6010	___EPA 200.7	X SW846 7060	___EPA 206.2
Barium	X SW846 6010	___EPA 200.7		
Beryllium	___SW846 6010	___EPA 200.7		
Boron	___SW846 6010	___EPA 200.7		
Cadmium	X SW846 6010	___EPA 200.7	___SW846 7131	___EPA 213.2
Calcium	___SW846 6010	___EPA 200.7		
Chromium	___SW846 6010	___EPA 200.7	___SW846 7191	___EPA 218.2
Cobalt	X SW846 6010	___EPA 200.7		
Copper	___SW846 6010	___EPA 200.7	___SW846 7211	___EPA 220.2
Iron	___SW846 6010	___EPA 200.7		
Lead	___SW846 6010	___EPA 200.7	___SW846 7421	___EPA 239.2
Lithium	___SW846 6010	___EPA 200.7		
Magnesium	___SW846 6010	___EPA 200.7		
Manganese	X SW846 6010	___EPA 200.7		
Mercury	___SW846 7470	___EPA 245.1		
Mercury	___SW846 7471	___EPA 245.5		
Molybdenum	___SW846 6010	___EPA 200.7		
Nickel	X SW846 6010	___EPA 200.7		
Potassium	___SW846 6010	___EPA 200.7		
Selenium	___SW846 6010	___EPA 200.7	___SW846 7740	___EPA 270.2
Silicon	___SW846 6010	___EPA 200.7		
Silver	___SW846 6010	___EPA 200.7	___SW846 7761	___EPA 272.2
Sodium	___SW846 6010	___EPA 200.7		
Strontium	___SW846 6010	___EPA 200.7		
Thallium	___SW846 6010	___EPA 200.7	___SW846 7841	___EPA 279.2
Tin	___SW846 6010	___EPA 200.7		
Titanium	___SW846 6010	___EPA 200.7		
Vanadium	___SW846 6010	___EPA 200.7		
Zinc	X SW846 6010	___EPA 200.7		

GLOSSARY OF DATA QUALIFIERS AND ABBREVIATIONS

Data Qualifiers

B	Compound was found in the blank and the sample
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis
E	Concentration exceeds the instrument calibration range and was subsequently diluted
I	Appears on the "results spreadsheet" to indicate an interference
J	Result is an estimated value below the reporting limit or a tentatively identified compound (TIC)
T	Compound was found in the TCLP extraction blank and the sample
U	Analyte was not detected at or above the reporting limit
X	Result obtained indirectly through calculation based on results from other analyses

Abbreviations

Batch	Designation given to identify a specific extraction, digestion or preparation set (equivalent to Prep Batch)
BS	Blank spike analysis was conducted on reagent grade water or a matrix free from the analyte of interest
BSD	Blank Spike Duplicate
BRL	Below Reporting Limit
CD	Calculation Factor used by the laboratory's Information Management System (LIMS)
Contract	Contract Laboratory Identification Code
DF	Dilution Factor
DL	Appears in the sample ID to indicate a secondary dilution was performed
LCS/LC	Denotes Laboratory Control Standard
LAB ID	The full 12 character Weston Laboratory Identification Number (equivalent to RFW#)
MB	Method Blank or (PB) preparation blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Applicable
NC	Non-calculable precision due to insufficient concentration of analyte present in the sample
NR	Not Required
NS	Not Spiked
RE	Appears in the sample ID to indicate a Re-analysis
REP	Replicate analysis
Reprep	Sample was reprepared and then reanalyzed
RFW#	The full 12 character WESTON Laboratory Identification Number (equivalent to LAB ID)
RFW Lot	The first 8 characters of the RFW#
RPD	Relative Percent Difference of duplicate analyses
RRF	Relative Response Factor
RT	Retention Time
RTW	Retention Time Window
SP	Blank Spike, Blank Spike Duplicate, Matrix Spike or Matrix Spike Duplicate
WO#	Work Order No. WESTON Code used to define a specific client, job, phase and task

NOTES:

- One or a combination of these data qualifiers and abbreviations may appear in the analytical report.
- Soil, sediment and sludge results are reported on a dry weight basis except when analyzed for landfill disposal or incineration parameters. All other results on a solid matrix are reported on an "as received" basis unless noted differently.
- Reporting limits are adjusted for preparation sample size, sample dilutions and sample moisture content if analyzed on a dry weight basis.