

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**  
Interim Final 2/5/99  
**RCRA Corrective Action**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
**Current Human Exposures Under Control**

Facility Name: Hoover Treated Wood Products, Inc.  
Facility Address: 18315 House Drive Milford, Virginia 22514  
Facility EPA ID #: VAD988190021

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

If yes - check here and continue with #2 below.

If no - re-evaluate existing data, or

If data are not available skip to #6 and enter "IN" (more information needed) status code.

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Current Human Exposures Under Control" EI**

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	<u>X</u>	—	—	<u>Arsenic</u>
Air (indoors) <sup>2</sup>	—	<u>X</u>	—	—
Surface Soil (e.g., <2 ft)	—	<u>X</u>	—	—
Surface Water	—	<u>X</u>	—	—
Sediment	—	<u>X</u>	—	—
Subsurf. Soil (e.g., >2 ft)	—	<u>X</u>	—	—
Air (outdoors)	—	<u>X</u>	—	—

\_\_\_\_\_ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

\_\_\_\_\_ If unknown (for any media) - skip to #6 and enter “IN” status code.

**Rationale and Reference(s):**

Hoover Treated Wood Products, Inc. (Hoover) is located on more than 53 acres of land approximately one mile south of the Town of Milford, Caroline County, Virginia. The facility lies in the Mattaponi River Valley, approximately one mile east of the Mattaponi River. The topography of the site is primarily flat, with the land sloping slightly to the north and south. The facility is bound on the north by a low-lying marshy intermittent drainage way and on the south by a swamp with oxbow lake features. Hoover preserves wood by pressure treatment with a chromate copper arsenate (CCA) solution and fire retardants. Historically, residual preservative materials were applied to the facility’s land after being mixed with a stabilizing agent.

Building One, located on the northwest portion of the Hoover facility, was the location where residual wood preservative materials were treated, temporarily stored, and stabilized. Based on approved closure activities, clean closure of Building One, its contents, and the underlying unsaturated soils was successfully completed on December 1, 1999 (DEQ correspondence letter to facility, dated December 1, 1999).

Area A, located on the northeast portion of the Hoover facility, was the location where the stabilized residual wood preservative materials were deposited. Based on approved closure activities, clean closure of unsaturated soils in Area A was successfully completed on November 30, 1999 (DEQ correspondence letter to facility, dated November 30, 1999). But, the DEQ had determined that Hoover’s closed waste management unit—Area A, had affected groundwater quality beneath the unit. Clean closure of

**Footnotes:**

<sup>1</sup> “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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the groundwater could not be achieved; thus, the post-closure care period for Area A shall continue until December 1, 2029.

Under the Post-Closure Care Permit, groundwater monitoring is being conducted in accordance with Permit Module VI – Area A Corrective Action Monitoring, and in accordance with the requirements of 40 CFR 264.100. The corrective action groundwater sampling network consists of one background well (MW-1) and four point of compliance wells (MW-4, MW-5, MW-6, and MW-7) (See Figure 1 attached). Semi-annual groundwater sampling activities are conducted in March and September. Also in the corrective action well network are seven monitoring wells that are measured for water levels only (MW-3, MW-9, MW-10, MW-11, MW-12, MW-13, and MW-14). In addition, recovery wells RW-1, RW-2, RW-3, RW-4, RW-5, RW-6, RW-7, RW-8, and RW-9 are part of a groundwater extraction system which is maintained and operated in accordance with the facility's ongoing corrective action program (See Figure 1 attached.).

Based on Hoover's 2007 Annual Groundwater Monitoring Report (AGWMMR), Hoover conducted groundwater sampling on March 14-15 and September 11-12, 2007. Groundwater samples were collected from the background well (MW-1) and four (4) point of compliance (POC) wells (MW-4, MW-5, MW-6, and MW-7) and were analyzed for constituents listed in Permit Attachment J – Groundwater Monitoring List, which were total arsenic, total chromium, and total copper. Sampling results for total arsenic are summarized in the table below:

Sampling Event	MW-1 (ug/l)	MW-4 (ug/l)	MW-5 (ug/l)	MW-6 (ug/l)	MW-7 (ug/l)	GPS for Arsenic (ug/l)
Dec-02	3.90 J	79.00	5960.00	10100.00	1950.00	12.06
Mar-03	< 5.00	18.00	682.00	272.00	3990.00	
Jun-03	< 5.00	28.00	638.00	95.00	2610.00	
Sep-03	< 5.00	17.00	835.00	353.00	1950.00	
Dec-03	7.00	26.00	406.00	111.00	1770.00	
Mar-04	3.50 J	36.00	103.00	59.00	948.00	
Jun-04	< 5.00	31.00	110.00	47.00	751.00	
Sep-04	5.00	27.00	197.00	63.00	970.00	
Dec-04	6.00	31.00	86.00	38.00	665.00	
Mar-05	2.90 J	56.00	54.00	34.00	636.00	
Jun-05	1.00 J	29.00	47.00	33.00	695.00	
Sep-05	< 5.00	27.80	317.00	174.00	1220.00	
Dec-05	9.11	26.60	169.00	102.00	899.00	
Mar-06	7.46	34.10	58.60	24.10	411.00	
Sep-06	3.99	31.10	317.00	69.00	962.00	
Mar-07	4.00	52.70	25.20	< 20.00	251.00	
Sep-07	< 4.00	16.30	291.00	67.20	817.00	
Mar-08	< 4.00	13.90	114.00	23.30	441.00	

J – Result is estimated value, compound detected at a concentration below the Practical Quantitation Limit.

< – Not detected above the Method Detection Limit.

Time series plots included in the AGWMMR showed that levels of the constituents were decreasing with time, especially since 2003, although total arsenic concentrations detected in all four (4) POC wells remained above the Groundwater Protection Standards (GPS) of 12.06 µg/l (See Figures 2 and 3).

In accordance with Section H of Appendix 6 of the Post-Closure Care Permit, the background limit is considered the GPS for arsenic since it is greater than the drinking water MCL. Statistical analysis of background data from upgradient well MW-1, prediction limits, and groundwater protection standards for total arsenic, total chromium, and total copper are summarized in the following table:

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	Upgradient			Prediction Limit Type	Prediction Limit	Groundwater Protection Standard
	N	Results non-detect or non-quantified	Detection Frequency			
			(%)		(ug/l)	(ug/l)
Total Arsenic	39	30	23.1	non-parametric	12.06*	10*
Total Chromium	39	22	43.6	non-parametric	14.5	100
Total Copper	39	14		log normal	111.07	1300

\*Since background is greater than the derived MCL for arsenic, 12.06 ug/l is the GPS.

**References:**

1. March 2008 Semi-Annual Groundwater RCRA Monitoring Report, ATC Associates
2. Annual Groundwater Monitoring Report – 2007, ATC Associates
3. Post Closure Permit, December 15, 2005
4. Building One Closure Report, October 27, 1999, ATC Associates
5. Area A Closure Report, September 17, 1999, ATC Associates

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

<u>Contaminated Media</u>	<u>Potential Human Receptors (Under Current Conditions)</u>						
	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>	<b>No</b>
Air (indoors)	_____	_____	_____	_____	_____	_____	_____
Soil (surface, e.g., <2 ft)	_____	_____	_____	_____	_____	_____	_____
Surface Water	_____	_____	_____	_____	_____	_____	_____
Sediment	_____	_____	_____	_____	_____	_____	_____
Soil (subsurface e.g., >2 ft)	_____	_____	_____	_____	_____	_____	_____
Air (outdoors)	_____	_____	_____	_____	_____	_____	_____

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated”) as identified in #2 above.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media – Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“\_\_\_\_\_”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

  X   If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

\_\_\_\_\_ If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) – continue after providing supporting explanation.

\_\_\_\_\_ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

Caroline County provides water and sewer service to the City of Milford. There are no known drinking water wells in the vicinity of the facility. The facility is surrounded by a lockable security fence. Workers and contractors are protected from groundwater exposures as static water levels vary from six (6) to eleven (11) feet below the ground surface. All personnel at the Hoover site and their contractors are trained to properly perform their assigned duties. At a minimum, all personnel involved with the facility's post-closure care activities receive training in the following areas:

- Area specific management practices regarding post-closure care activities,
- Security and safety,
- General and area specific inspections and record keeping,
- Regulatory updates which affect operations and activities, and
- Job function and procedural descriptions of each employee's respective role in post-closure care.

Annual training includes, but is not limited to: OSHA8-hour Refresher, OSHA and Employee's Workplace Rights, Hazard Communication, Health Awareness and Evaluation, Health Effects of Chemicals: Characteristics of Hazardous Chemicals – Toxic Properties of Hazardous Chemicals, Medical Surveillance

<sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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Requirements, Fire Protection and Safety, Air Monitoring and Equipment, Decontamination Procedures, Site Control, and Sampling Techniques and Procedures.

Hoover's Corrective Action Program is incorporated into the Post-Closure Care Permit. Hoover submitted a Corrective Action Plan (CAP) on June 15, 2001. The purpose of the CAP was to achieve a reduction of concentrations of metals in the groundwater within Area A, to gain and maintain hydraulic control of groundwater along the southern border of the site near MW-3, and to gain and maintain hydraulic control of groundwater along the northeast property boundary near MW-4 (See Figure 1 attached.). The groundwater remediation (extraction/recovery) system has been constructed with the northern section of the groundwater remediation system starting operations in January 2003 and the southern section starting operation in April 2003.

The remediation system at the site is comprised of subsurface components (recovery wells, submersible pumps, transfer piping, and flush mount traffic rated man-ways) to minimize disruption to the facility operations. Groundwater is pumped from each well via buried piping into a 15,840 gallon vertical storage tank located within the bermed area east of the treatment plant. The water from the storage tank is introduced into the facility process stream. The water is used to mix wood treating solutions for generation of product at the facility. The production process uses an average of six thousand (6,000) gallons of water per day for production of treated wood products. The recovery rates of the wells are being adjusted to provide for continuous hydraulic control at a flow rate that the facility has the capability of processing. From January 2003 through March 2008 (5+ yrs.), the system has recovered 10, 685,464 gallons of impacted groundwater.

System performance of the recovery wells is being evaluated on a regular basis. Influent analytical data and flow measurements are being used to estimate the mass removal rate of contaminants. Through March 13, 2008, cumulative mass recovery of total arsenic, total chromium, and total copper were 234.16 lbs., 0.88 lbs., and 6.93 lbs., respectively. The groundwater well system is sampled semiannually to evaluate whether arsenic concentrations in groundwater have decreased. Time series plots included in the AGWMMR showed that levels of the arsenic constituent were decreasing with time (See Figure 3). Furthermore, groundwater elevations are measured semiannually to evaluate groundwater flow direction and whether hydraulic control of the impacted groundwater has been maintained. Groundwater Elevation Contour Maps for the March 2007 and October 2007 sampling events are attached.

Therefore, human health exposure to contaminated groundwater is not a complete exposure pathway under current conditions.

Residents: Caroline County provides water and sewer service to the City of Milford. There are no known drinking water wells in the vicinity of the facility. The Hoover facility lies in a light industrial area and the contaminated groundwater plume is contained within the facility boundaries.

Workers and Construction Workers: Workers and contractors are protected from groundwater exposures as static water levels vary from six (6) to eleven (11) feet below the ground surface. Groundwater is used in the production process but there is no direct contact of workers with groundwater. Workers regular duties do not involve contact with ground water. All personnel at the Hoover site and their contractors are trained to properly perform their assigned duties and are covered under OSHA. Construction workers are covered under OSHA and are trained in using PPEs. There presently are no construction activities on-going or planned at the facility.

Trespassers: There are no trespassers as facility has security fence and lockable gates.

Day-Care, Recreation, and Food: Hoover is located in a light industrial area and there are no known daycare services at the facility. The groundwater is not used for recreational purposes and is contained on site. Food is not grown on-site, and there are no known residential wells that are used by neighboring communities to grow food.

**References:**

1. March 2008 Semi-Annual Groundwater RCRA Monitoring Report, ATC Associates
2. Annual Groundwater Monitoring Report – 2007, ATC Associates
3. Post Closure Permit, December 15, 2005





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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code 125 (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

**YE** - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Hoover Treated Wood Products, Inc.** facility, EPA ID #**VAD988190021**, located at **Milford, VA** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

**NO** - "Current Human Exposures" are NOT "Under Control."

**IN** - More information is needed to make a determination.

Completed by: (signature) *A. Alonso*  
(print) **Angela Alonso**  
(title) **Environmental Specialist II**

Date 9/12/08

Supervisor: (signature) *Leslie A. Romanchik*  
(print) **Leslie Romanchik**  
(title) **Director, Office of Hazardous Waste**  
(EPA Region or State) **Virginia Department of Environmental Quality**

Date 9/15/08

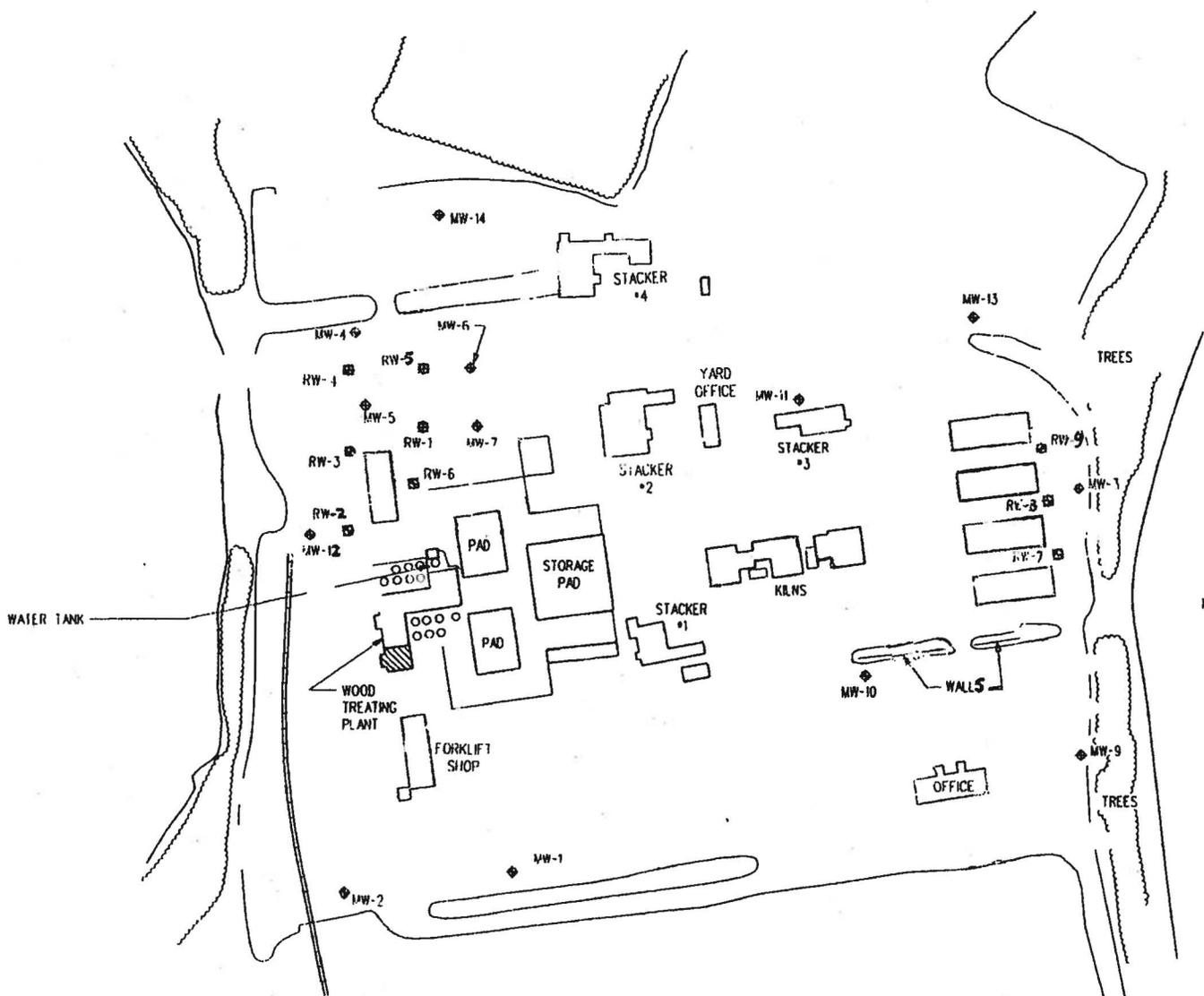
Locations where References may be found:

**Virginia Department of Environmental Quality**  
**Waste Division, Office of Hazardous Waste**  
**629 East Main Street**  
**Richmond, VA 23219**

Contact telephone and e-mail numbers

(name) **Trisha Johnson**  
(phone #) **(804) 698-4131**  
(e-mail) **tjohnson@deq.virginia.gov**

**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**



0 80 160 320  
SCALE IN FEET

Well Network	Well #
Background Well	MW-1
	MW-4
Point of Compliance Wells	MW-5
	MW-6
	MW-7
Water-level Monitoring Wells	MW-3
	MW-9
	MW-10
	MW-11
	MW-12
	MW-13
	MW-14
Extraction Wells	RW-1
	RW-2
	RW-3
	RW-4
	RW-5
	RW-6
	RW-7
	RW-8
	RW-9



**Figure 1 - Hoover Site Map & Well Network**

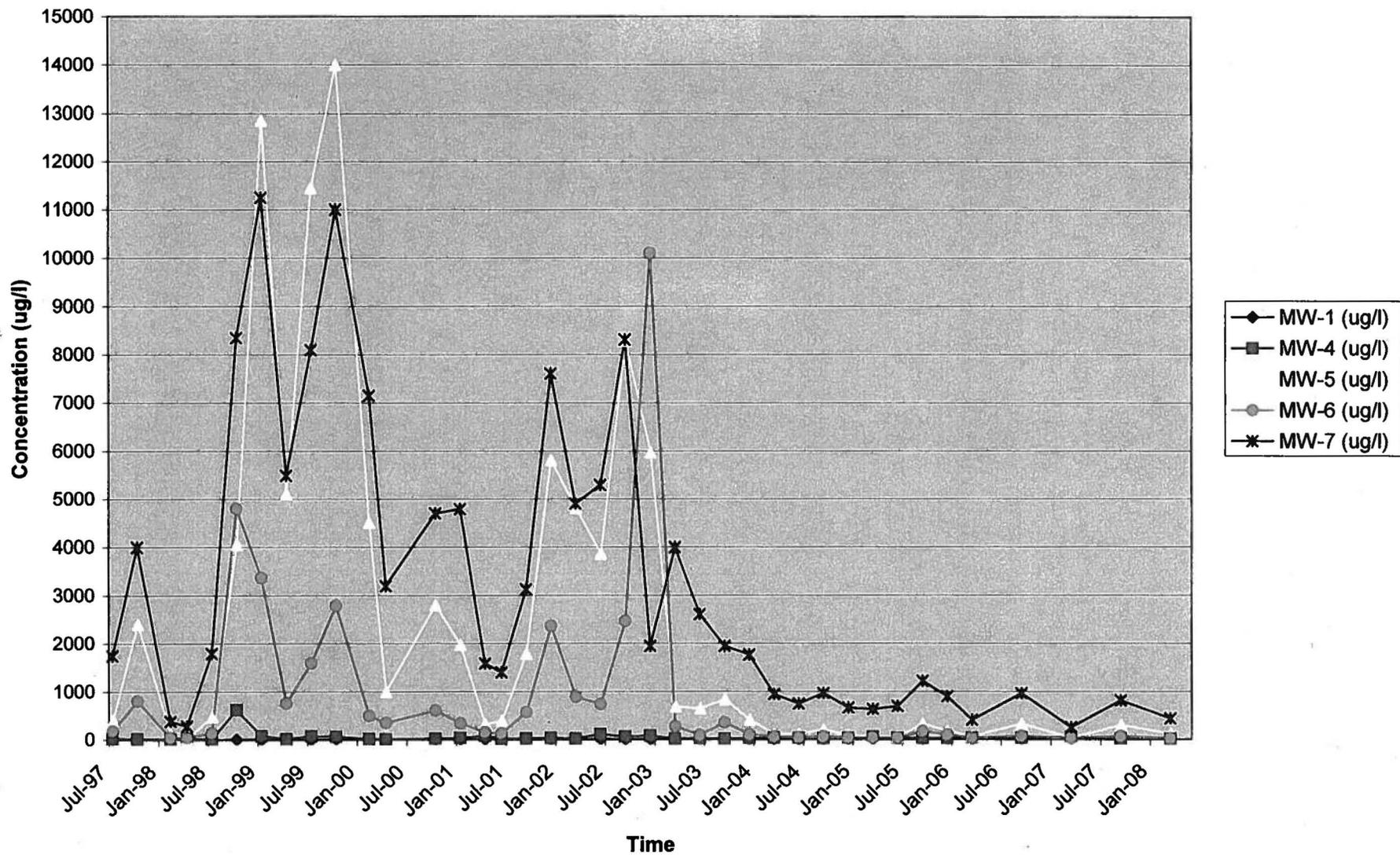
HOOVER TREATED WOOD PRODUCTS, INC.  
18315 HOUSE DRIVE  
MILFORD, VIRGINIA

DATE: 09-15-2008  
SCALE: 1" = 160'  
PROJECT NO.: 45.17929.9806

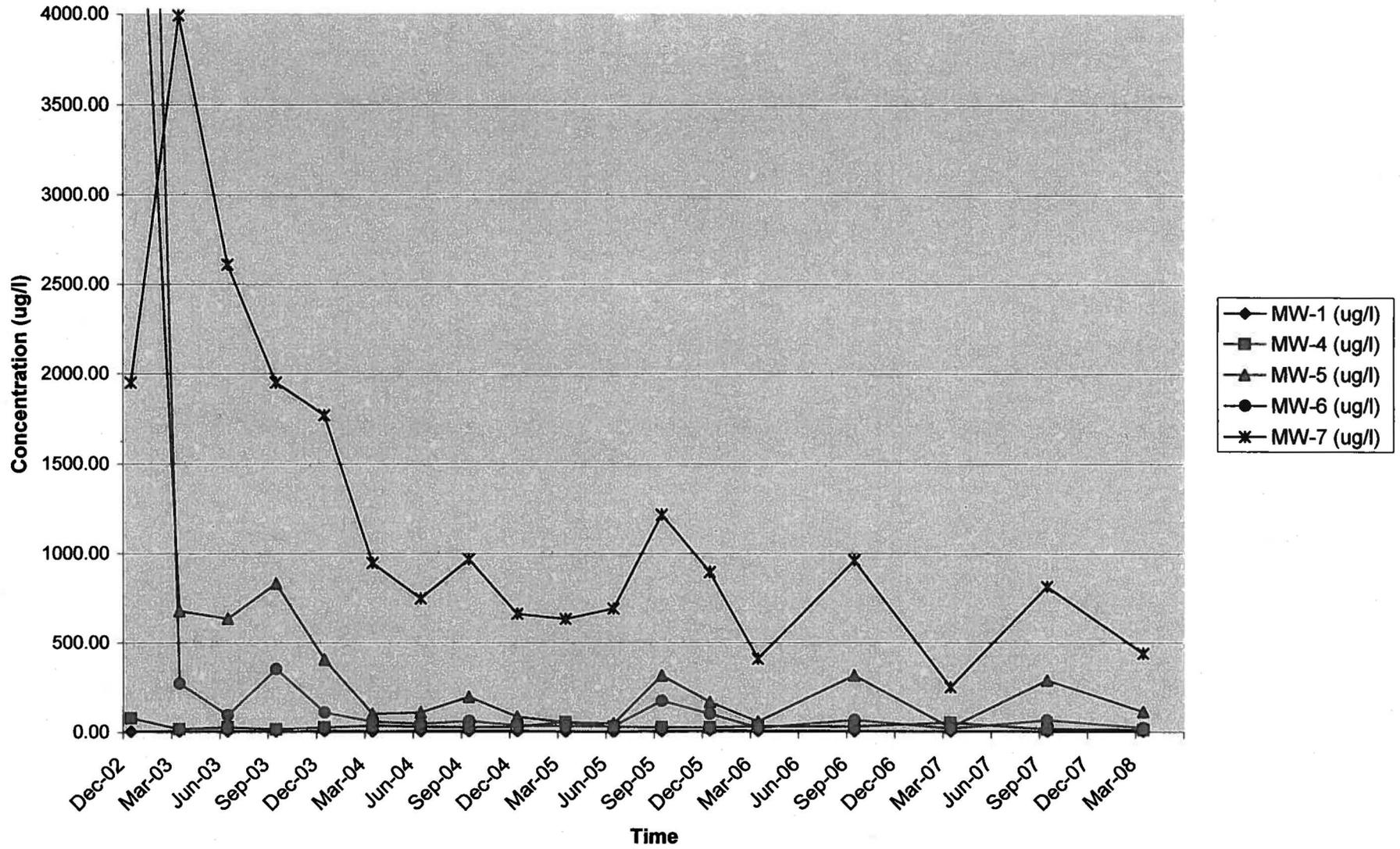
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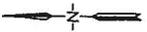
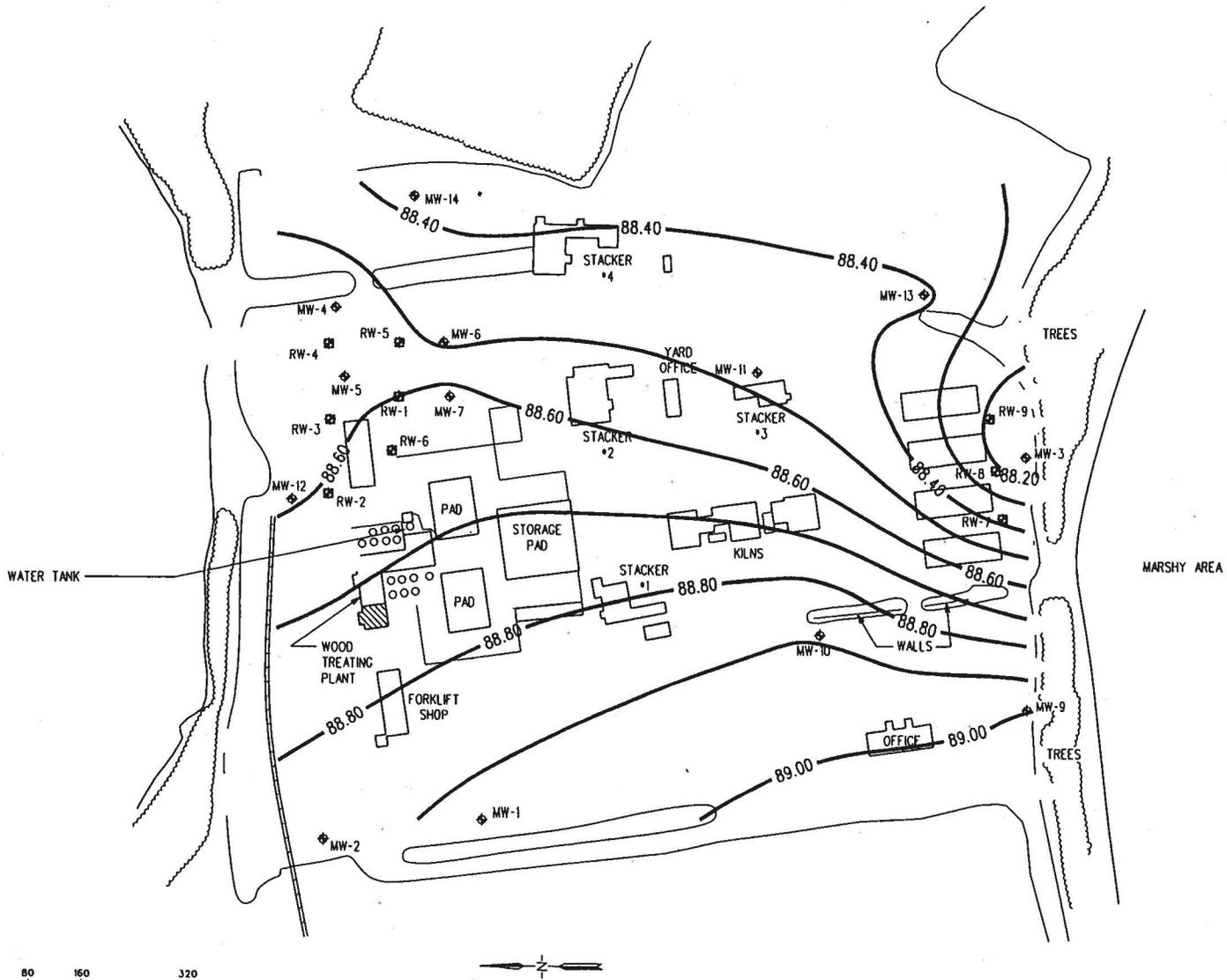
NOTES

**Figure 2**  
**Concentration vs. Time**  
**Total Arsenic**



**Figure 3**  
**Concentration vs. Time**  
**Total Arsenic**





— 88.60 —  
(90.34)

GROUNDWATER ELEVATION CONTOUR (11.1)  
GROUNDWATER ELEVATION (11.1) (SEE TABLE)

09/12/2007	
WELL ID	GW. ELEV.
MW-1	88.93
MW-2	NM
MW-3	88.10
MW-4	88.58
MW-5	88.58
MW-6	88.45
MW-7	88.62
MW-8	NM
MW-9	89.00
MW-10	88.86
MW-11	88.48
MW-12	88.56
MW-13	88.40
MW-14	88.37

NOTES:  
1. GROUNDWATER SAMPLES WERE COLLECTED ON 09-12-2007.  
2. MW-10, MW-11, MW-12, MW-13, AND MW-14 ARE VPOES COMPLIANCE WELLS.

GROUNDWATER ELEVATION CONTOUR MAP  
HOOVER TREATED WOOD PRODUCTS, INC.  
18315 HOUSE DRIVE  
MILFORD, VIRGINIA



Raleigh, North Carolina 27684  
 (919) 871-9999 FAX (919) 871-9335  
 PROJECT NO. 45-17929-9806  
 DATE 10-03-2007  
 SCALE 1" = 160'

TYPE CODE 125701.DGN  
 PREP BY  
 REV BY  
 DATE