



RDMS DocID 106711

RCRA RECORDS CENTER
FACILITY Vanderbilt Chemical
I.D. NO. CTD 001181205
FILE LOC. 12-13
OTHER 106711

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: Vanderbilt Chemical Corporation
Facility Address: 31 Taylor Avenue, Bethel, CT 06801
Facility EPA ID #: CTD 001181205

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).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)
Page 2

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated” 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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>X</u>	<u> </u>	<u> </u>	<u>arsenic, selenium, VOCs (1,2-DCA, benzene, CS₂, etc.)</u>
Air (indoors) ²	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Surface Soil (e.g., <2 ft)	<u>X</u>	<u> </u>	<u> </u>	<u>arsenic (one sample exceeds R/IDEC of 10 mg/Kg)</u>
Surface Water	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Sediment	<u> </u>	<u>X</u>	<u> </u>	<u> </u>
Subsurf. Soil (e.g., >2 ft)	<u>X</u>	<u> </u>	<u> </u>	<u>arsenic, cadmium, lead (above CT RSR IDEC)</u>
Air (outdoors)	<u> </u>	<u>X</u>	<u> </u>	<u> </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):

The following media are **not** known or reasonably suspected to be contaminated above appropriate risk-based standards: air (indoors), surface water, sediment, and air (outdoors). The indoor air on-site is not reasonably suspected to be contaminated above appropriate risk-based levels because there is no groundwater plume beneath any of the on-site manufacturing or administrative buildings with volatile organic compound (VOC) concentrations exceeding the most stringent residential groundwater volatilization criteria (RGWVC) provided under the Connecticut Remediation Standard Regulations (RSRs).

(continued on attachment)

Footnotes:

¹ “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).

² 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.

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

Page 3

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>	Potential <u>Human Receptors</u> (Under Current Conditions)						
	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food
Groundwater	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>YES</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>
Air (indoors)	_____	_____	_____	_____	_____	_____	_____
Soil (surface, e.g., <2 ft)	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>YES</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>
Surface water	_____	_____	_____	_____	_____	_____	_____
Sediment	_____	_____	_____	_____	_____	_____	_____
Soil (subsurface e.g., >2 ft)	<u>NO</u>	<u>NO</u>	<u>NO</u>	<u>YES</u>	<u>NO</u>	<u>NO</u>	<u>NO</u>
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.

- _____ 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).
- X 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):

See attachment.

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

Current Human Exposures Under Control
Environmental indicator (EI) RCRIS code (CA725)

Page 4

- 4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be "**significant**"⁴ (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) .skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

X If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable" for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) .skip to #6 and enter "IN" status code

Rationale and Reference(s):

Groundwater – Construction and groundwater. This completed exposure pathway has a potential to be significant because certain constituent concentrations (e.g., arsenic) are orders of magnitude above the appropriate risk-based criteria; however these potential exposures are not expected to be significant because the extent of any construction activities would be limited, and protective measures would be taken to control and/or minimize the potential risks. Should construction activities commence in these areas, the work will be performed using trained personnel in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 and a formal health and safety plan using personal protective equipment as necessary.

Surface soil (e.g., <2 ft) – Construction and surface soil. Any potential exposure from this completed pathway is not expected to be significant because the affected area is far removed from the active manufacturing operations and the developed portion of the site. The maximum affected area is relatively small (~500 ft²) based on the compliant concentrations in the adjacent surface soil samples. Also, the extent of any construction activities would likely be limited, and protective measures would be taken to control and/or minimize the potential risks. These measures include contractor health and safety prior to initiating any excavation. Should construction activities commence in the area, the work will be performed using trained personnel in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 and a formal health and safety plan using personal protective equipment as necessary. (continued on attachment)

⁴ If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)
Page 5

5 Can the “significant” exposures (identified in #4) be shown to be within acceptable limits?

- If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
- If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.
- If unknown (for any potentially “unacceptable” exposure) continue and enter “IN” status code

Rationale and Reference(s):

Groundwater and Construction – The potential significant exposures for this completed pathway are within acceptable limits because the likelihood of completing this exposure pathway are low, and several protective measures can be taken to control and greatly minimize the potential exposure risks. The areas with constituent concentrations in groundwater exceeding criteria do not underlie the active manufacturing areas and are primarily located in the southern flow regime well south of the developed portion of the site. Thus, the likelihood of excavating below the groundwater table in these areas is extremely low. Should it become necessary, the work would be performed using trained personnel in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 and a formal health and safety plan using personal protective equipment as necessary.

Surface soil (e.g., <2 ft) and Construction – The potential significant exposures for this completed pathway are within acceptable limits because the likelihood of completing this exposure pathway are low, and several protective measures can be taken to control and greatly minimize the potential exposure risks. The affected area is located more than 250 feet from the active manufacturing areas in the undeveloped portion of the site. Thus, the likelihood of necessary construction in this area is extremely low. Should it become necessary, the work would be performed using trained personnel in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 and a formal health and safety plan using personal protective equipment as necessary.

Subsurface soil (e.g., >2 ft) and Construction – The potential significant exposures for this completed pathway are also within acceptable limits. The areas with constituent concentration exceeding criteria in the subsurface soils are limited, as shown on Figure 2.1 in the Phase II CMS. During planned remediation activities in Work Areas #3, 5, and 6, the work will be performed using trained personnel in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 and a formal health and safety plan using personal protective equipment as necessary. No other construction activities are planned in any of the affected areas. Construction activities in the closed surface impoundment area are prohibited by deed restriction and are highly unlikely, except to perform cap repairs. Accordingly, exposures are within acceptable limits.

**Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)**

Page 6

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (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 Vanderbilt Chemical Corporation, facility, EPA ID # CTD 001181205 located at 31 Taylor Avenue, Bethel, Connecticut 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)  Date Sept 8, 2004
(print) Mark Barmasse, P.E., LEP, DEE
(title) Associate

Supervisor (signature)  Date 9/20/04
(print) Matthew R. Hogland
(title) Section Chief
(EPA Region or State) Reg. I

Locations where References may be found:

Malcolm Pirnie, Inc., 100 Roscommon Drive (Suite 100), Middletown, Connecticut 06457

Contact telephone and e-mail numbers

(name) Mark Barmasse
(phone #) (860) 635-3400
(e-mail) mbarmasse@pirnie.com

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.

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

RCRA Corrective Action Environmental Indicator (EI) RCRIS Code (CA 725)

Current Human Exposures Under Control

Attachment:

Page 2 – continued...

Regarding the potential off-site indoor air exposures, the Site (and surrounding area) groundwater is classified as GB and the current land use of the Site is industrial. The CTDEP has informed us that the *proposed* groundwater volatilization criteria (which are more stringent than the existing criteria for the majority of compounds) are more protective of public health and should be used as the appropriate risk-based criteria for comparison to the groundwater sample results. The VCC groundwater database was queried for all detected VOC concentrations that exceed the proposed volatilization criteria since calendar year 2000 (both the RGWVC and the IGWVC). *All detected VOC concentrations since the March 2000 monitoring event are below the proposed IGWVC. Furthermore, all detect VOC concentrations since March 2000 are below the proposed RGWVC at the downgradient property boundary and in the vicinity of on-site buildings.* There are limited exceedances of the proposed RGWVC; however, none are located near on-site buildings or along the property boundary. Ethylbenzene and xylenes at well MW-3S and 1,2-dichloroethane (DCA) at well MW-2I are the only compounds exceeding the proposed RGWVC since year 2000. Note that these exceedances are only marginally above the proposed RGWVC (e.g., 1,2-DCE concentrations of up to 8.6 ug/L, which is slightly above the proposed RGWVC of 6.5 ug/L) and that neither of these wells (MW-3S and MW-2I) are located along the downgradient property boundary. Furthermore, there are wells downgradient of both MW-3S and MW-2I that show no exceedances of the proposed RGWVC for any compound. Thus, because all detected VOC concentrations along the downgradient property boundary are below the most stringent groundwater volatilization criteria (the RGWVC), it is highly unlikely that workers in the on-site buildings or the off-site buildings downgradient of the Site would be exposed to indoor air impacted by VOCs in groundwater above the appropriate risk-based standards.

Surface water sampling of the nearby Sympaug Brook was conducted in 1999. Certain metals such as selenium and lead have been detected in the surface water at concentrations exceeding the Chronic FALC both upstream and downstream of the site. Consequently, the site does not appear to be adversely affecting the surface water quality in Sympaug Brook. Regarding sediment, the on-site wetland areas near the former sludge lagoons were remediated during the surface impoundment closure in 1995-96. There are limited areas on-site with sediment, as opposed to soil, as the primary surface material. These areas are located south and east of the developed portion of the site, and access to these areas is restricted by a perimeter fence. The outdoor air is not known or suspected to be contaminated above standards because there are no groundwater plumes with VOC concentrations exceeding the RGWVC in the developed portion of the site. Additionally, site-wide VOC concentrations are below the industrial/commercial groundwater volatilization criteria (IGWVC).

Groundwater – Arsenic, selenium, and a few VOCs have been detected at concentrations exceeding appropriate risk-based criteria (maximum contaminant levels (MCLs)) for drinking water or the groundwater protection criteria (GWPC) and surface water protection criteria (SWPC) under the CT Remediation Standard Regulations (RSRs). A prominent bedrock ridge divides the site into northern and southern groundwater flow regimes. In the northern flow regime, few constituents have been detected above the appropriate risk-based criteria as discussed in the Phase II Corrective Measures Study (CMS) prepared by Malcolm Pirnie in November 1999. Section 3.0 of the Phase II CMS indicates that metals are the primary constituent of concern in the

northern flow regime, although some VOCs have also been detected in groundwater. Barium, selenium, and zinc were the only metals detected during the most recent sample events during August and September 1999. Section 4.4.2 of the Phase II CMS provides additional details of the groundwater quality in the northern flow regime. This section states that barium was the only metal to exceed an appropriate risk-based standard (10X the national ambient water quality criteria (10XNAWQC)) during the most recent sample events in 1999; however, the exceeding barium concentrations are consistent with background values and are not indicative of a groundwater plume emanating from the work areas. Section 4.4.2 also details the historical VOC data and the data collected during the most recent sample events (August and September 1999). This section states that 1,1-dichloroethylene (1,1-DCE) was the only VOC historically detected above the residential groundwater volatilization criteria. However, this detection was not beneath a building, the only place where the groundwater volatilization criteria apply. Additionally, this VOC was not detected during the 1999 sampling events. Carbon disulfide and 1,1-dichloroethane (DCA) were the only VOC detected during the 1999 sampling, and concentrations were below the most stringent criteria (10X NAWQC).

It should be noted that Vanderbilt will re-initiate quarterly groundwater monitoring in the northern flow regime for an initial period of one year as discussed in our June 11, 2004 "Work Plan for RCRA CA Investigations" submitted to CTDEP. In addition to monitoring select existing wells in the northern flow regime starting in 2005, a series of new monitoring wells will be installed within the northern flow regime to complement the existing well network and completely characterize any potential releases and residues remaining in the groundwater in this portion of the Site.

In the southern flow regime, 12 wells surrounding the closed surface impoundment are currently monitored quarterly under the RCRA post-closure monitoring program. An overview of the groundwater quality in the southern flow regime is also presented in the Phase II CMS (subsection 2.4.2). The 2003 Annual Groundwater Monitoring Report presents the most recent groundwater quality data from the southern flow regime. Arsenic, selenium, and select VOCs have been detected at concentrations exceeding risk-based criteria (MCLs, GWPC, or SWPC) at several monitoring wells in the southern flow regime. Arsenic and selenium are fairly widespread in the southern flow regime, being detected above appropriate risk-based criteria in at least half of the 12 wells monitored quarterly. Cadmium was also detected above criteria in at least one monitoring well during 2003. Detected concentrations at the downgradient property boundary are generally lower than those in the central portion of the Site near unremediated Work Areas or the former surface impoundment. While select concentrations of arsenic and selenium exceed the SWPC, monitoring of Sympaug Brook does not indicate any impacts on surface water quality from the Site. The VOC concentrations exceeding criteria are much more sporadic. Carbon disulfide, benzene, and 1,2-DCA are the most prevalent, exceeding criteria in at least two monitoring wells each during calendar year 2003. Additionally, acetone, ethylbenzene, and xylene also exceeded criteria in at least one well during 2003. The well most affected by these constituents is well MW-21, located within the fenced former surface impoundment. This well contained arsenic, selenium, sulfate, and four VOCs (acetone, benzene, 1,2-DCA, and carbon disulfide) above appropriate risk-based standards during 2003. The VOC concentrations at the downgradient property boundary are generally lower than those detected in the central portion of the Site near the unremediated Work Areas or within the former surface impoundment.

The remaining monitoring wells in the southern flow regime (TW-1, TW-2, MW-11, 1D, 9S, and 10S) are gauged for water level elevations quarterly but have not been sampled since approximately 1992. These wells were dropped from the routine monitoring based on their distance from the impoundment and low concentrations of constituents of concern compared to wells adjacent to the impoundment. Because these wells have not been sampled since 1992 and the Site conditions have changed considerably since then, Vanderbilt plans to monitor two of these wells (TW-1 and MW-11) during one of the upcoming quarterly sample events in early 2005. The proposed sampling and analysis plan for these wells is detailed in our June 11, 2004 letter (Work Plan) to CTDEP.

Surface Soil (e.g., <2 ft) – One sample drilled in 1996 (BC-4 (0-2)) contained arsenic at a concentration of 36.8 mg/kg, exceeding the R/IDEC of 10 mg/kg. This is the only surficial sample (less than 2 feet below current grade) with any constituent concentration exceeding appropriate risk-based criteria.

Subsurface Soil (e.g., >2 ft) – Arsenic, cadmium, and lead have been detected in subsurface soils at concentrations exceeding the CT RSR industrial/ commercial direct exposure criteria (IDEC). Chemically stabilized soil exceeding the IDEC exist in the area of the closed surface impoundments below a RCRA cap consisting of a dual membrane cap and three feet of cover soils. These surface impoundments were certified as closed in accordance with the approved closure plan in 1997. The site also contains 16 Work Areas divided into the Group A and Group B Work Areas for convenience based on their location on-site. Many of the Work Areas have been successfully remediated as shown on the attached remediation status summary table. The Phase I CMS, approved by the Connecticut Department of Environmental Protection (CTDEP) in 1999, presents a comprehensive overview of the subsurface soil data in the unremediated Work Areas. Only the Group A Work Areas contain any constituent above the IDEC. Tables 2.1 and 2.2 in the Phase I CMS present the VOC and metals data, respectively, from the Group A Work Areas. All VOC concentrations are below the IDEC. Arsenic, cadmium, and lead have been detected above the IDEC. Interim corrective measures (ICM) were performed at the unremediated Group A Work Areas #3, 5, and 6 including limited excavation and placement and compaction of the soil cap. The remaining Work Areas requiring remediation are scheduled to be remediated in 2004, as discussed in Vanderbilt's RCRA Corrective Action Schedule letter dated 2/27/04 (attached).

Page 3 – Continued...

Rationale and Reference(s):

Remediation of soil via excavation is planned at Work Areas #3, #5, and #6 during 2004. The work will be performed using trained personnel in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 and a formal health and safety plan using personal protective equipment, as necessary. No other "construction" is planned in or near any of the unremediated Work Areas.

Groundwater – Construction and groundwater. An exposure pathway could be completed when workers excavate down to groundwater. Workers could contact contaminated groundwater. Groundwater beneath the site is classified as GB and is not used for drinking water. The Vanderbilt facility as well as much of the downgradient surrounding area is served by public water. A private well survey was conducted during the RCRA Facility Investigation (RFI) in 1988-90. The original survey identified approximately 40 wells within a ½-mile radius of the site, the majority of which were located upgradient (east) of the site. The potentially at-risk downgradient wells and a subset of the upgradient wells (a total of 12 of the 40 identified) were sampled semi-annually for two years. Tables 4-56 and 4-57 in the Phase I CMS present the results of the private well sampling. The data indicate that the sampled wells are likely not affected by historical operations or releases from the Vanderbilt site. As discussed in the attached letter, Vanderbilt committed to update the private well survey and perform confirmatory private well sampling as part of continuing RCRA Corrective Action activities.

Updated Private Well Survey

As discussed in Vanderbilt's February 27, 2004 and June 11, 2004 letters to the CTDEP (attached), Malcolm Pirnie recently completed an updated private well survey in the vicinity of the Site. To be consistent with the previous well survey, the new survey covered the same area – those properties within ½-mile from the former RCRA units.

A total of 52 private wells were identified within the survey area. Of these 52 wells, 33 were also

identified in the previous (1989) well survey, and 19 are new wells installed after the previous well survey was completed. The majority of the identified wells are located hydraulically upgradient of the Vanderbilt Site, along Taylor Avenue and Nashville Road. Of the 19 new wells identified, three (3) are located downgradient of the site, but are located to the west of and on the opposite side of Sympaug Brook, more than 1,000 feet west of the Vanderbilt Site.

As discussed in Vanderbilt's February 27 letter and in Malcolm Pirnie's June 11, 2004 letter to CTDEP, Vanderbilt will perform supplemental private well sampling as an update to the sampling performed from 1989 through 1991. During the previous private well sampling program, five upgradient wells and seven downgradient wells were sampled. Similar to the previous private well sampling program, a subset of the identified wells will be monitored for site-related constituents (VOCs and metals), including the potentially affected downgradient wells. The three newly identified downgradient wells across Sympaug Brook were not initially proposed for sampling because they are well to the west of Sympaug Brook and the previously sampled private wells on the east side of Sympaug Brook had not shown indications of contamination. CTDEP, upon receipt of our June 11, 2004 letter, requested that Vanderbilt either sample the three newly identified downgradient wells or provide a rationale that Sympaug Brook acts as a hydrologic boundary for groundwater flow from the Vanderbilt Site. As explained in the attached memorandum dated August 5, 2004, a hydrogeological assessment and generalized hydrogeologic model of the Site and surrounding area were performed. This assessment indicates that Sympaug Brook is, in all likelihood, the receptor of groundwater flow from the Vanderbilt Site. Additionally, Sympaug Brook is also the apparent receptor of groundwater flow from the west side of Sympaug Brook. Thus, groundwater from the Vanderbilt Site cannot reasonably be expected to affect the groundwater quality or private wells west of Sympaug Brook.

If the private well sampling program indicates contamination in any of the private wells attributable to activities on the Vanderbilt Site, then additional investigations may be performed to identify the source(s), nature, and extent of such contamination.

Surface Soil (e.g., <2 ft) – Construction and surface soil. An exposure pathway could be completed when workers excavate in the area with surface soil contamination. The area with contaminated surface soil is well delineated, and the entire site is fenced prohibiting access to residents and trespassers. The area is also far removed from active manufacturing operations and the developed portion of the site.

Subsurface Soil (e.g., >2 ft) – Construction and subsurface soil. An exposure pathway could be completed when workers excavate in areas with subsurface soil contamination. There is a perimeter fence surrounding the site prohibiting access to residents and trespassers. Additionally, the Work Areas with constituent concentrations exceeding criteria fenced with orange construction fencing, prohibiting workers from accessing these areas. Construction activities in the closed surface impoundment area are prohibited by deed restriction and are highly unlikely, except to perform cap repairs. These surface impoundments were certified as closed in accordance with the approved closure plan in 1997. Accordingly, exposures are within acceptable limits.

Page 4 – Continued...

Subsurface soil (e.g., >2 ft) – Construction and subsurface soil. Any potential exposures from this completed pathway could be significant because certain constituent concentrations are well above the numeric criteria; however, the extent of any construction activities would be limited, and protective measures would be taken to control and minimize any potential exposures, including contractor health and safety training prior to initiating excavation. Should construction activities commence in these areas, the work will be performed using trained personnel in compliance with the Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.120 and a formal health and safety plan using personal protective equipment as necessary.
