



State of Ohio Environmental Protection Agency

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**Certified Mail**  
**Return Receipt Requested**  
9171082133393208128854

**Re: Former Reilly Tar & Chemical Corp.**  
**EPA ID # OHD 083 320 945**  
**Decision Document of Corrective Action**

December 16, 2010

Mr. John Jones, P.E.  
Director, Regulatory Management  
Vertellus Specialties, Inc.  
300 N. Meridian Street, Suite 1500  
Indianapolis, In 46204-1763

Dear Mr. Jones:

Here is the final Declaration and Decision Document for the Former Reilly Tar and Chemical Corporation (Reilly Tar) property in Cleveland, Ohio. Staff at Ohio EPA, Division of Hazardous Waste Management (DHWM), issued a Statement of Basis seeking public input on the proposed remedies on September 29, 2009. The Agency received comments concerning the Statement of Basis and, as such, the responsiveness summary is included for your review.

Since the proposed remedies appear to comply with applicable hazardous waste rules, the Declaration and Decision Document represent the selected remedy for the Reilly Tar property, in accordance with the policies of Ohio EPA and the statutes and regulations of the State of Ohio.

In accordance with the Ohio EPA's Evaluation of the Selected Remedy section of this report (section 4.2), use of the site will be restricted from residential or agricultural activity, and groundwater will be restricted from use as drinking water. Use of the site will be limited to industrial purposes only through enactment of an Environmental Covenant, an enforceable mechanism under Ohio law that can be used to restrict property use. The Environmental Covenant will include a legal description of the subject property, identifying the contaminated areas and describe acceptable and unacceptable land uses.

Ted Strickland, Governor  
Lee Fisher, Lieutenant Governor  
Chris Korleski, Director

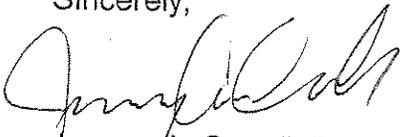
Former Reilly Tar and Chemical Corporation  
Mr. John Jones  
Page 2

You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised Code. The appeal must be in writing and set forth the action complained of and the grounds upon which the appeal is based. The appeal must be filed with the Commission within thirty (30) days after notice of the Director's action. The appeal must be accompanied by a filing fee of \$70.00 which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Notice of the filing of the appeal shall be filed with the Director within three (3) days of filing with the Commission. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. An appeal may be filed with the Environmental Review Appeals Commission at the following address:

Environmental Review Appeals Commission  
309 South Fourth Street, Room 222  
Columbus, OH 43215

If you have any questions concerning the Corrective Action remedies selected, please call Harry Courtright of Ohio EPA's Northeast District Office at (330) 963-1200.

Sincerely,



Jeremy A. Carroll, P.E.  
Manager, Regulatory and Information Services Section  
Division of Hazardous Waste Management

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cc: Mike Allen, ERAS, DHWM, CO  
Harry Courtright, DHWM, NEDO  
Carol Hester, PIC  
DHWM, NEDO  
file

## PUBLIC NOTICE

Cuyahoga County

### OHIO EPA ISSUES DECLARATION AND FINAL DECISION DOCUMENT FOR FORMER REILLY TAR & CHEMICAL FACILITY

On December 16, 2010, Ohio EPA issued a Declaration and final Decision Document to the Former Reilly Tar and Chemical Corporation (Reilly Tar), currently known as Vertellus Specialties, Inc., located at 3201 Independence Road, Cleveland, Ohio 44105. The EPA Identification Number for this facility is OHD083320945.

#### **Why does Reilly Tar need a final Decision Document?**

The Decision Document identifies Ohio EPA's selected remedy for the site, and explains the reasons for the selection of the remedy.

This Decision Document presents the selected remedial action for the site in accordance with the policies of the Ohio EPA and the statutes and regulations of the State of Ohio. The remedy includes the incorporation of an environmental covenant which restricts use of the property to industrial use only. An isolation barrier and down gradient monitoring well maintenance and periodic evaluation of ground water migration is also required as outlined in Section 4.2 of the Decision Document.

#### **Can I appeal this final Decision Document?**

Yes, if you are an officer of an agency of the state or of a political subdivision, acting in a representative capacity, or any person who would be aggrieved or adversely affected by the Decision Document, you have the right to appeal this Permit decision to the Environmental Review Appeals Commission (ERAC).

#### **If I decide to appeal this final Decision Document, how and when must I make the appeal?**

If you file an appeal, you must put it in writing no later than January 17, 2011. Your appeal must explain why you are appealing the action and the grounds you are using for your appeal. The appeal must be accompanied by a filing fee of \$70.00 which the Commission, in its discretion, may reduce if by affidavit you demonstrate that payment of the full amount of the fee would cause extreme hardship. Ohio EPA requests that a copy of the appeal be served upon the Ohio Attorney General's Office, Environmental Enforcement Section. You must file your appeal, according to Ohio Revised Code §3745.04 with ERAC at the following address: **Environmental Review Appeals Commission**, 309 South Fourth Street, Room 222, Columbus, Ohio 43215. You must send a copy of the appeal to the director of Ohio EPA at the following address no later than three (3) days after you file it with ERAC: **Chris Korleski, Director of Ohio EPA**, P.O. Box 1049, Columbus, Ohio 43216-1049.

# DECLARATION

OHIO E.P.A.

DEC 16 2010

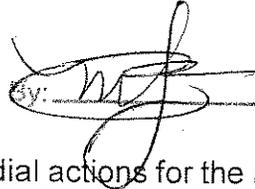
## SITE NAME AND LOCATION

Vertellus Specialties, Inc.  
3201 Independence Road  
Cleveland, Ohio (Cuyahoga County)

ENTERED DIRECTOR'S JOURNAL

I certify this to be a true and accurate copy of the official documents as filed in the records of the Ohio Environmental Protection Agency.

## STATEMENT OF BASIS AND PURPOSE

By: 

Date: 12.16.2010

This Decision Document presents the selected remedial actions for the Former Reilly Tar and Chemical Corporation Facility site in accordance with the policies of the Ohio Environmental Protection Agency and the statutes and regulations of the State of Ohio.

## ASSESSMENT OF THE SITE

The Former Reilly Tar and Chemical Facility site is located on 11.8 acres at 3201 Independence Road, Cleveland, Ohio. Reilly Tar began operations in 1937 processing coal tar from neighboring steel facilities to produce various grades of tars, oils and pitches that were later transported off-site to customers. The facility ceased all operations in 2000. Reilly Tar and Chemical Corporation changed its name in 1989 to Reilly Industries, Inc. In 2006, Reilly Industries, Inc. changed its name to Vertellus Specialties, Inc., after a merger with Rutherford Chemicals.

Under Ohio EPA's direction, Vertellus Specialties, Inc. (Vertellus) conducted a site investigation to characterize the nature, extent and migration rate of potential hazardous constituent releases from the facility. Surface soils were presumed by Vertellus to have polynuclear aromatic hydrocarbon (PAH) contamination from past facility activities. Surface samples were collected to verify this assumption. Vertellus proceeded under the presumption that an isolation barrier would be needed to prevent direct contact with surface soil facility-wide.

Subsurface and ground water sampling was completed to determine the impact, nature, extent and migration rate of potential hazardous constituent releases from the facility. The soils and ground water were found to contain monocyclic and polycyclic aromatic hydrocarbons and a few metals (notably arsenic and mercury in soils and arsenic, barium, nickel and tin in the ground water).

Upon assessment of the sampling results, Ohio EPA concludes that exposure to the contaminants present in their unmitigated form are at levels that may be unacceptable for the typical future outdoor worker, the on-site construction worker and the indoor worker. The potential risks for the outdoor and construction workers are based on incidental ingestion and dermal contact with potentially carcinogenic PAHs in soil. The potential risk for the future indoor worker is based on inhalation of benzene (vapor intrusion from ground

DEC 16 2010

water). The direct contact exposure pathway for ground water via human consumption, however, is incomplete because of the "Urban Setting" designation for the area and ground water is not used for any purpose. Finally, modeling showed no constituents were identified as having the potential to migrate from ground water to the surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria.

#### DESCRIPTION OF THE SELECTED REMEDIES

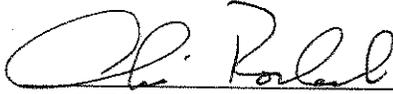
The selected remedies will include:

- Land use restrictions
  - Prohibit the use of the shallow ground water across the entire facility
  - limit any use other than industrial operations;
  - prohibit any disturbance of or below the two foot isolation barrier with the exception of monitoring or remediation activities or utility work and
  - prohibit placement of any type of structure (mobile or permanent) above the isolation barrier that does not also have satisfactory protective controls addressing potential vapor intrusion, including controls preventing vapor migration along any installed utilities.
- Isolation barrier
  - Eliminate worker exposures
  - Restrictions on excavation
  - Fencing and vegetation management plan
  - Installation of a cover
  - Maintaining a cover
  - Monitoring well abandonment
- Down-gradient monitoring well maintenance and periodic evaluation of ground water migration
- Financial assurance instrument maintenance to cover all associated costs of the site, including design, installation and maintenance of the isolation barrier.

DEC 16 2010

STATUTORY DETERMINATIONS

Today's selection and required implementation of remedial actions is protective of human health and the environment, is in accordance with applicable State and federal laws and is responsive to public participation and input. The remedies utilize permanent solutions, to the maximum extent practicable, to reduce the toxicity, mobility and volume of hazardous substances at the Former Reilly Tar and Chemical Corporation Facility. The effectiveness of the remedies will be reviewed regularly.



Chris Korleski  
Director

12/14/10  
Date

OHIO EPA DHHM

DEC 16 2010

Decision Document for the Remediation of the  
Former Reilly Tar and Chemical Corporation Facility  
3201 Independence Road, Cleveland, Ohio  
(Cuyahoga County)  
OHD 083 320 945

Prepared By  
The Ohio Environmental Protection Agency  
November, 2010

DEC 16 2010

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## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>3</b>
1.1	Executive Summary.....	3
1.2	How the Corrective Action Process Works .....	4
<b>2.0</b>	<b>Site History.....</b>	<b>4</b>
<b>3.0</b>	<b>Summary of the Facility Assessment .....</b>	<b>5</b>
3.1	Site Wide Ground Water.....	6
3.1.1	Site Wide Ground Water Evaluation Criteria.....	8
3.2	Site Wide Soil.....	8
3.2.1	Soil Evaluation Criteria .....	9
3.3	Summary of Facility Risk .....	10
<b>4.0</b>	<b>Evaluation and Selection of Remedies .....</b>	<b>13</b>
4.1	Description of the Evaluation Criteria .....	13
4.2	Ohio EPA's Evaluation of the Selected Remedies.....	14
<b>5.0</b>	<b>Conclusions .....</b>	<b>18</b>

DEC 16 2010

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## 1.0 INTRODUCTION

### 1.1 Executive Summary

The Ohio Environmental Protection Agency (Ohio EPA) has prepared this Decision Document for the remediation of the Former Reilly Tar and Chemical Corporation Facility (Reilly Tar) site in Cleveland, Ohio. This Decision Document identifies Ohio EPA's selected remedies and explains the reasons for the selection of the remedies.

Under the Resource Conservation and Recovery Act (RCRA), the Corrective Action program was created to address threats to human health and the environment from historic or past waste management areas at RCRA treatment, storage or disposal facilities. The Reilly Tar property (currently owned by Vertellus Specialties, Inc.) is subject to RCRA Corrective Action requirements because Reilly Tar established and operated a hazardous waste management unit on facility property. This unit was an unpermitted storage unit. Reilly Tar submitted a closure plan to Ohio EPA in July 1988 for the unpermitted storage area. Closure completion was certified by Ohio EPA in October 1995.

To address the corrective action requirements, Vertellus Specialties, Inc. (Vertellus) voluntarily agreed to work with Ohio EPA's Division of Hazardous Waste Management (DHWMM), and has conducted extensive soil and ground water sampling at the facility. A summary of the facility investigation is discussed in Section 3.

Ohio EPA reviewed Vertellus' submittals that document the results of the facility investigation and previously available information and has selected remedies to remediate the site. The evaluation criteria Ohio EPA used in selecting the remedies are discussed in Section 4.

In brief, the corrective measures for the Reilly Tar site include providing an isolation barrier two feet thick over the facility property, an operation and maintenance plan for the barrier, ground water monitoring in down gradient wells, ground water monitoring well abandonment, and facility property use restrictions. A summary of Ohio EPA's selected remedies is discussed in Section 5. Ohio EPA finds that these remedies will further protect public health and the environment by permanently reducing risks to acceptable levels once the remedies are implemented.

DEC 16 2010

## 1.2 How the Corrective Action Process Works

The initial step in the corrective action process for facilities regulated under RCRA is site characterization or investigation to define the nature and extent of contamination at the facility. The information collected supports the selection and implementation of a remedy or remedies. This step culminates with the facility's submission of a report summarizing the investigation data. Vertellus has completed an investigation and submitted a report to Ohio EPA for review.

In the next step of the corrective action process, Ohio EPA generates a Statement of Basis which summarizes the Agency's preferred remedies for the facility. This document is then made available to the public for review and comment. Ohio EPA issued the Statement of Basis for the Former Reilly Tar and Chemical Corporation Facility site on September 29, 2009, commencing a 45-day public comment period. Copies of the Statement of Basis were made available to the public at the Ohio EPA - Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio and, Ohio EPA, Division of Hazardous Waste Management, 50 West Town Street, Suite 700, Columbus, Ohio. Ohio EPA received comments during the comment period and a responsiveness summary has been prepared as an attachment to this document.

After considering all comments received during the public comment period, Ohio EPA then issues a Decision Document. This document meets that purpose and is the Decision Document for the Former Reilly Tar and Chemical Corporation Facility site in Cleveland, Ohio.

## 2.0 SITE HISTORY

The Former Reilly Tar and Chemical Corporation Facility site is located on 11.8 acres at 3201 Independence Road, Cleveland, Ohio. Reilly Tar purchased the property in 1936 and for the next 60 years facility operations consisted of processing coal tar from neighboring steel facilities to produce various grades of tars, oils and pitches that were later transported off-site to customers. The facility ceased all operations in 2000. Facility demolition was conducted in 2000 and 2001 under a demolition permit granted by the City of Cleveland. All former storage tanks, overhead piping, buildings and other structures were removed from the facility property at that time. The facility property is currently owned by Vertellus Specialties Inc<sup>1</sup>, and is vacant and unoccupied.

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<sup>1</sup> Reilly Tar and Chemical Corporation changed its name in 1989 to Reilly Industries, Inc.. In 2006, Reilly Industries, Inc. changed its name to Vertellus Specialties, Inc. after a merger with Rutherford Chemicals.

DEC 16 2010

On September 5, 2006, Ohio EPA notified Vertellus that the former Reilly Tar and Chemical Corporation Facility property is subject to RCRA corrective action requirements. This was based on an Ohio EPA file review which determined that Reilly Industries, Inc. established and operated a hazardous waste management unit on facility property. This unit was an unpermitted storage unit. Reilly Tar submitted a closure plan to Ohio EPA in July 1988 for the unpermitted storage area. Closure completion was certified by Ohio EPA in October 1995.

### 3.0 SUMMARY OF THE FACILITY ASSESSMENT

Under Ohio EPA's direction, Vertellus conducted a site investigation to characterize the nature, extent and migration rate of potential hazardous constituent releases from the facility.

Surface soils were presumed by Vertellus to have polynuclear aromatic hydrocarbon (PAH) contamination from past facility activities. Surface samples were collected to verify this assumption. Vertellus proceeded under the presumption that an isolation barrier would be needed to prevent direct contact with surface soil facility property wide.

Subsurface and ground water sampling was completed during three field work phases to determine the impact, nature, extent and migration rate of potential hazardous constituent releases from the facility. The sampling was conducted on-site as well as off-site.

- **Phase I** – Phase I focused on determining whether there had been an impact on subsurface soils and/or ground water from historical operations, and if so, whether those impacts had adversely affected off-site ground water or the nearby Cuyahoga River. Phase I consisted of installing four ground water monitoring wells, collecting subsurface soil samples, collecting ground water samples from the newly installed wells, and determining groundwater flow direction. Results from the assessment presented in Vertellus' report dated November 2007 identified non-aqueous phase liquid (NAPL) in one on-site well (MW-2), dissolved constituents of concern (COC) in two of the four newly installed monitoring wells, and dark staining of soil in the unsaturated and saturated borings completed in the central portions of the property. Since Reilly Tar processed a wide variety of tar products, staining and odors were referred to as coal tar distillate (CTD). Given this information and the need to further characterize the extent of ground water conditions found in Phase I, Phase II was developed and implemented with Ohio EPA's approval.

DEC 16 2010

• **Phase II** – Phase II was performed in December 2007 to fill the data gaps identified during Phase I including: i) collecting physical and analytical soil information needed to complete a health-based risk assessment; ii) determining whether CTD was present in soils in other portions of the property; and iii) determining if the downgradient ground water impacts had or were likely to result in an unacceptable risk to off-site groundwater receptors. Phase II resulted in collecting five additional surface soil samples for the risk assessment, installing five additional wells, and sampling all of the existing and newly installed wells for COC. Phase II results culminated in Ohio EPA's acknowledgement that on-site ground water conditions had been adequately assessed, and that surface soil and ground water analytical results were suitable for use in a health-based risk assessment. Observations of CTD in on-site soils were consistent with past facility property operations and were not regarded as a concern. However, Ohio EPA asked Vertellus to assess off-site soils and ground water to the east (on the Heidtman property) to demonstrate whether: i) the presence of CTD in soils diminished off-site; ii) NAPL identified in MW-2 was present off-site; and iii) the levels of dissolved COC observed in on-site wells dropped in the off-site down gradient wells. A work plan was developed and agreed to by Ohio EPA that targeted an off-site area to the east (Phase III).

• **Phase III** – Phase III activities in July 2008 included completing three off-site soil borings to determine the depth of ground water, recording soil conditions as the borings were advanced, assessing the absence or presence of CTD, installing / developing / sampling all temporary wells, and noting the absence or presence of NAPL before the wells were abandoned. The three off-site wells were positioned to provide an off-site "mate" to MW-2, MW-3 and MW-6. Field observations did not identify significant impact from CTD in the down gradient direction. Furthermore, analytical results from the ground water samples were successful in demonstrating that dissolved COC decreased in concentrations from the facility property boundary to off-site locations. Combined, this information suggests there is little to no risk to off-site ecological or human receptors.

Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

### 3.1 Site Wide Ground Water

Ground water level measurements were recorded between each phase of work to ensure that well screens were designed to cross the water table. Between Phase I and Phase II, water levels were recorded in all four wells three times. Between Phases II and III, water levels in wells were recorded up to 6 times in all nine wells. Given the number of water elevation measurements during separate seasons, trends were noted

DEC 16 2010

at each well and between wells to develop ground water contours, ground water flow direction and ground water gradients.

Based on the information collected during the assessment, depth to ground water ranged from 7 to 20-feet below grade and mimics topography by flowing in a north/northeasterly direction. Ground water flows from upgradient well MW-1 towards wells MW-3, MW-4 and MW-6. Hydraulic gradients vary across the facility property.

For example, in the southern portion of the facility property, the hydraulic gradient between wells MW-1 and MW-5 is very shallow with a gradient of 0.005 feet per foot. In the central portion of the facility property, the gradient generally increases from 0.020 to 0.060-feet per foot. In the northeastern portion of the facility property near TW-3, ground water gradient slightly increases to 0.070 to 0.080 feet per foot. The full hydrogeological facility property setting is detailed in the RCRA Corrective Action Investigation Final Report.

Geologically, the Reilly Tar property is located within the Eastern Lake Section of the Central Lowland Province, near the north end of the Appalachian Plateaus Province, locally within the Cuyahoga River valley physiographic unit. The Cuyahoga River valley is a pre-glacial valley deeply cut into the underlying bedrock. During the period of glacial advance, the Cuyahoga River valley widened, and was ultimately filled in with several hundred feet of glacial till, lacustrine and alluvium (river laid sediments). The alternating layers of glacial till and lacustrine material within the pre-glacial valley were deposited mainly during the Wisconsin Glacial Episode. A layer of glacial till (unstratified clay) was deposited across this area with each advance of the ice sheet and during each recession of the glacier, lacustrine sediments (sand, silt and clay) were laid over the till.

After departure of the glacier, fluvial deltas made up of sand, silt and gravel were formed over the remaining glacial sediments from the post-glacial lakes. Alluvium, or river-laid sediments (mainly sand), was deposited by the river. The base of the pre-glacial valley lies near or directly beneath the facility property. The Cuyahoga River lies generally west of the former pre-glacial river valley.

To gain a better understanding of the local geology affecting the occurrence of ground water and the flow direction of ground water, local records were researched. Records review identified 28 soil boring logs (1,500 to 2,000 feet north of the facility property at ground elevations 570 to 590 feet above mean sea level [MSL]) from borings drilled and sampled through the Cuyahoga River valley sediments to depths of 240 to 340 feet below grade. These logs recorded fluvial-delta deposits and alluvium

DEC 16 2010

sediments consisting of sand, gravel and silt along with fill material from ground surface to a depth of approximately 30 feet below grade.

Below this layer was a uniform thickness of soft to very stiff unsorted glacial till extending to a depth of approximately 40 to 65 feet. Beneath the glacial till was a layer of soft, stratified lacustrine clays with thicknesses ranging from approximately 10 to 15 feet. Underlying the lacustrine clays are continuous layers of till and other lacustrine sediments with thicknesses ranging from 190 to 260 feet down to the bedrock surface (elevation 325 to 270 feet MSL).

Logs from borings nearest the facility property along the western banks of the Cuyahoga River encountered bedrock believed to be consistent with the old river valley walls because bedrock depths became shallower west and northwest of the facility property. The base of the post-glacial valley has been mapped a short distance east of the current river location and is oriented in a north/northeasterly direction and appears to be directly beneath the facility property.

Bedrock underlying the facility property is estimated to be approximately 400 feet below grade (elevation 240 feet MSL). Bedrock would be expected to consist of the Lower Mississippian Bedford Shale and the Devonian Cleveland and Chagrin Members of the Ohio Shale. Shale units typically are very dense and have low groundwater yields ranging from 0 to 5 gallons per minute (gpm). In comparison, wells installed in the Cuyahoga River valley sand and gravel units have yields ranging from 100 to 300 gpm.

### **3.1.1 Site Wide Ground Water Evaluation Criteria**

The highest detected levels on-site showed that coal tar distillate (CTD) was detected in some monitoring wells. These wells were located on-site. The sample from MW-2 was mainly a coal tar distillate and was analyzed as a waste dilution. Down gradient monitoring wells showed COC levels that were protective of an industrial scenario in the risk assessment. Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

A summary of facility risk based on the data is included in Section 3.3.

### **3.2 Site Wide Soil**

Soil borings were completed on-site and off-site that encountered fill materials and native soils. Soil boring logs show fill material consisting of reworked sands mixed with

DEC 16 2010

rock, brick, wood and slag fragments ranging in thickness from 2 to 14 feet below grade on-site and 6 to 8 feet below grade off-site. Native soils were characterized as fine to coarse grained, well sorted sand with varying densities having silt concentrations from approximately 5 to 20 percent between borehole locations. Based on research of the regional geology/hydrogeology, native soil encountered would be considered part of the fluvial-delta deposits and could extend to a depth of approximately 100 feet below grade.

During the three phases of assessment, no bedrock or aquitards (e.g. clays) were encountered in any of the soil borings completed to the depth of 30 feet. Saturated soils were encountered at depths ranging from 4 to 18.7 feet below grade. Fill and native soil in the central and northeastern portions of the facility property contained staining, defined as coal tar distillate (CTD), CTD odors, or when CTD was present in the liquid phase, the material was referred to as product/NAPL. The lateral extent of the CTD on the eastern portion of the facility property appears to be aligned from south to north between MW-9, SB-9, MW-2, MW-6 and the nearby soil boring SB-4 where CTD odor, staining and/or NAPL was observed during completion of the soil borings or wells. East of the property boundary on the Heidtman property, borings TW-1 and TW-2 contained either CTD staining or odors. In the central portion of the facility property, from south to north, SB- 6, MW-5 and SB-3 contained CTD odors and/or NAPL. On the western side of the property, from south to north, CTD staining, odors, and/or NAPL were observed in SB-7, SB-5 and SB-2.

By contrast, the southern (upgradient) and northern (downgradient) soil borings and monitoring well locations were generally clean and no CTD staining or NAPL were observed. In the southern (upgradient) portion of the facility property, soil borings and/or well locations that did not exhibit CTD staining or odor are SB-11, SB-20, MW-1, SB-10, SB-19 and SB-8. On the northern (down gradient) portion of the facility property MW-3, SB-1, SB-17, MW-4 and MW-7 did not contain CTD staining or NAPL.

In general, the CTD was observed in unsaturated fill and native sands, and saturated intervals within the borings on the elevated, western portion of the facility property, near Independence Road, and within saturated native sands in other borings located in the central portion of the facility property.

### 3.2.1 Soil Evaluation Criteria

Contaminant levels in samples of surface soil are above risk-based levels for direct contact by future workers. Compounds with elevated levels include: benzene,

DEC 16 2010

ethylbenzene, styrene, toluene, total xylenes, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic and mercury.

Levels of tar related compounds were found in subsurface soils above risk-based levels for some exposure pathways. Compounds with elevated levels include: benzene, ethylbenzene, styrene, toluene, total xylenes, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic and mercury.

Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

### 3.3 Summary of Facility Risk

The human health and ecological risk assessment was performed using site-specific analytical information compiled during Phase I and Phase II of the assessments. All work was conducted in a manner consistent with standards and customary approaches specified by Ohio EPA's Division of Hazardous Waste Management (DHWM) under RCRA, as well as standard and customary U.S. EPA approaches as needed. The purpose of the risk assessment was to provide quantitative analyses, in a conservative manner, of the likelihood that adverse health effects may be associated with potential exposures to constituents in the environmental media associated with past facility property operations. In providing health-related information on potential human contact with facility property-associated constituents, this risk assessment was designed to provide a sound basis for risk management decisions.

All of the analytical results from soil samples collected during Phase I and II were used to identify COC that were compared to Ohio EPA screening values. Benzene, ethylbenzene, styrene, toluene, total xylenes, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic and mercury were identified as COC for direct contact with soil.

DEC 16 2010

Although ground water is not used for drinking, COC for groundwater were identified as benzene, ethylbenzene, toluene, total xylenes, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzofuran, fluoranthene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, phenanthrene, pyrene, naphthalene, arsenic, barium, nickel, tin, cyanide and sulfide. NAPL was encountered in two on-site monitoring wells. COC for potential vapor intrusion from ground water into indoor air of future buildings at the facility property consisted of benzene, toluene, 1-methylnaphthalene, 2-methylnaphthalene and naphthalene.

Based on ground water flow modeling, there were no COC identified as having the potential to migrate from ground water to surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria.

The levels of COC in soil and ground water varied across the site. The highest detected levels on site showed that CTD was detected in some monitoring wells. These wells were located on-site. The sample from MW-2 was mainly a coal tar distillate and was analyzed as a waste dilution. Down gradient monitoring wells showed COC levels that were protective of an industrial scenario in the risk assessment. Sampling data can be found in the RCRA Corrective Action Investigation Final Report.

The human receptors evaluated in the assessment consist of future outdoor workers, future indoor workers and future construction workers. The outdoor workers were assessed for incidental ingestion and dermal contact with surface soil, and inhalation of volatile emissions and airborne particulates associated with wind erosion. The construction workers were evaluated for these same exposure routes for potential exposure to COC in both surface and subsurface soil. The indoor workers were assessed for inhalation of volatile emissions in indoor air (vapor intrusion)

The results of the analyses indicate that the potential noncancerous hazard indices in the unmitigated condition for the future outdoor and indoor workers are above the target benchmark of 1. A hazard index of 1 is established by Ohio EPA. For the future construction worker, the cumulative hazard index is below 1. The hazard index for the outdoor worker is driven by inhalation of naphthalene in outdoor air (volatilizing from soil). For the future indoor worker, the hazard index is driven by inhalation of benzene and naphthalene (vapor intrusion from ground water).

The cumulative potential cancer risks in the unmitigated condition exceed Ohio EPA's potential risk benchmark of  $1 \times 10^{-5}$  for future outdoor and indoor industrial and construction workers. The potential excess lifetime cancer risks for the outdoor and

DEC 16 2010

construction workers are based on incidental ingestion and dermal contact with potentially carcinogenic polynuclear aromatic hydrocarbons in soil. The potential excess lifetime cancer risk for the future indoor worker is based on inhalation of benzene (vapor intrusion from ground water).

There were no constituents identified as having the potential to migrate from ground water to the surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria. Therefore, no additional measures are necessary to address potential surface water exposures by human or ecological receptors.

Based on the results of the risk assessment the following risk management conclusions were drawn:

- Potential excess lifetime cancer risks for the outdoor and construction workers are based on incidental ingestion and dermal contact with potentially carcinogenic PAHs in soil;
- A potential excess lifetime cancer risk for the future indoor worker is based on inhalation of benzene(vapor intrusion from ground water);
- To prevent potential soil exposures for future outdoor workers, install an isolation barrier to block direct contact with the soil and eliminate fugitive emissions, and mitigating potential for exposure for outdoor workers;
- Use restrictions placed on the property in the form of an Environmental Covenant would
  - 1) Restrict property use
  - 2) Restrict ground water use
  - 3) Restrict all invasive activities
- No additional measures are necessary to address potential surface water exposures by human or ecological receptors because modeling showed no constituents were identified as having the potential to migrate from ground water to the surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria;
- The direct contact exposure pathway for ground water via human consumption is incomplete because of the "Urban Setting" designation for the area and ground

DEC 16 2010

water is not used for any purpose. An Environmental Covenant will restrict all use of ground water.

## 4.0 EVALUATION AND SELECTION OF REMEDIES

### 4.1 Description of the Evaluation Criteria

As part of the facility investigation/corrective measures/remedy study process, criteria for evaluating potential remedies were developed by U.S. EPA under the RCRA corrective action program. The evaluation criteria are found in U.S. EPA guidance documents. The criteria are used by Ohio EPA to evaluate the remedies for a facility when it is determined that environmental conditions on the property require some type of action to reduce the potential risk to human health and the environment, posed by the presence of environmental contaminants, to acceptable levels. The evaluation criteria are listed and described below:

#### Remedy Selection Evaluation Criteria

For a proposed remedy to be considered a viable remedy when implemented, it must meet the threshold criterion that it be protective of human health and the environment. An option of "no action" to be implemented to address the contaminated soils is not acceptable to Ohio EPA. Even though the intended use of the property is industrial, there is no legally enforceable mechanism in place to prevent the property from being converted to residential use in the future.

To ensure the affected portion of the property continues to be used only for industrial purposes, Ohio EPA considered as a remedy that the property owner and Ohio EPA enter into an Environmental Covenant. An Environmental Covenant is a legally enforceable mechanism that would describe the property and limits its use to industrial purposes. The Covenant would list appropriate land use while also describing what uses would not be allowable. The Covenant would run with the land and attach to the property deed and could not be changed without the written agreement of both the property owner and Ohio EPA even if the property was sold at some point in the future. Ohio EPA would monitor the property periodically to ensure that its use was consistent with the allowed uses listed in the Covenant.

In addition, an isolation barrier would be required to be placed on the property. "Isolation barrier" is designated as a surface of soil, slag, concrete, asphalt or similar material that prevents exposure of surface soils to future industrial and construction

DEC 16 2010

workers. An Operation & Maintenance Plan for the protective cover would be developed and implemented.

## 4.2 Ohio EPA's Evaluation of the Selected Remedies

Ohio EPA reviewed the RCRA Corrective Action Investigation Final Report provided by Vertellus. The following remedies were evaluated using the criteria described in Section 4.1.

- Land use restrictions
  - (Environmental Covenant)
- Isolation barrier
  - Eliminate worker exposures
  - Restrictions on excavation
  - Fencing and vegetation management plan
  - Installation of a cover
  - Maintaining a cover
  - Monitoring well abandonment
- Downgradient monitoring well maintenance and periodic evaluation of ground water migration.

### Description of Remedy

Ohio EPA is requiring an Environmental Covenant, an isolation barrier or cover system to eliminate unacceptable exposures to hazardous constituents and monitoring of the ground water to ensure the remedy remains in place and effective into the future.

DEC 16 2010

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### Environmental Covenant

- The facility must enter into an Environmental Covenant prohibiting the following activities at the facility: 1) use of ground water except for the purposes of monitoring and remediation; 2) any use other than industrial operations; 3) any disturbance of or below the two foot isolation barrier with the exception of monitoring or remediation activities or utility work and 4) placement of any type of structure (mobile or permanent) above the isolation barrier that does not also have satisfactory protective controls addressing potential vapor intrusion, including controls preventing vapor migration along any installed utilities.

### Isolation Barrier

- The facility must install a two foot isolation barrier over areas of the property that were previously used for operations (only the existing green space along Independence Road would not require any new cover).
- The isolation barrier may consist of slag, clay or other materials in proposed storage areas. Ohio EPA approval of construction materials and a plan for implementation of the isolation barrier is required before construction.
- Those areas of the facility property that are not used for storage will not necessarily be covered with slag but other materials which may include soil or asphalt, or a combination, depending on the final plans for the facility property. The facility will establish a flexible approach to accommodate the beneficial reuse of the facility property.
- Tasks that are to be completed for constructing an outdoor storage area or other site development include: obtaining appropriate permit(s); filling pits, sumps, trenches and other man-made openings (not depressions); and demolishing or knocking over obstructions extending more than a few feet above existing grade (large concrete structures will be left in place). All concrete and paving that is below grade or up to a few feet above grade may be left in-place.
- Any soils unearthed by demolition actions or installation of an access ramp will be evaluated and receive Ohio EPA approval before disposition.
- The retaining walls currently at the facility property may be incorporated into the final isolation barrier design.

DEC 16 2010

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- Any construction work or other invasive activities, including the installation or maintenance of utilities, must be performed under a Health and Safety Plan that protects workers against unacceptable exposure to identified hazardous constituents. The Construction Plan must include notice/notification procedures to be implemented to ensure construction and utility workers are aware of site conditions.
  - In the event that property use precludes the use of soil or slag, asphalt may be the preferred approach for providing an isolation barrier. Any areas where an asphalt or concrete cap is used in lieu of 2 feet of soil or slag, as well as the areas with a 2 foot barrier require a construction, operation and maintenance plan that must be submitted to Ohio EPA for approval. Additionally, financial assurance would have to be provided for any ongoing operation and maintenance. Alternatively, where surface soils pose a direct exposure pathway, a suitable soil type and thickness will be proposed for Ohio EPA approval as an isolation cover to promote the growth of vegetation.
  - Storm drainage will be addressed as part of permitting in accordance with regulatory requirements. The design will ensure that there is no erosion of the slag, and no sediment-laden runoff from the isolation barrier slag.
  - All soils placed as part of the isolation barrier will be seeded. Slag will not have a vegetative cover.

#### Ground Water Monitoring

- The facility will ensure proper monitoring well abandonment of on-site wells which could be compromised by the anticipated use. The proposed outdoor storage activities would incorporate heavy machinery and truck traffic. This traffic could damage the above grade monitoring wells. The facility may alternatively choose to keep the wells in place and engineer a protective structure around the well head to ensure it will not be compromised.

The facility must ensure proper maintaining and periodic sampling of the downgradient monitoring wells. These monitoring wells should be left in place and entered into an ongoing operation and maintenance plan. This plan would require approval by Ohio EPA. Included in the plan would be action detection limits for the downgradient wells.

DEC 16 2010

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### Evaluation of How the Selected Remedies Meet the Threshold Criteria

The threshold criteria discussed in Section 4.1 above are met, via the implementation of an isolation barrier and land use limitation through an Environmental Covenant.

An Environmental Covenant, under Ohio Revised Code §5301.80 to §5301.92, Ohio's version of the Uniform Environmental Covenants Act, is defined as a real property servitude arising under an environmental response project (or Corrective Action) that imposes activity or use limitations on the facility property. As a servitude, the Environmental Covenant is a legal device that creates a right or an obligation that runs with the land (and is binding upon future property owners) and is enforceable by Ohio EPA. The Environmental Covenant will include a legal description of the property, the areas of contamination and the land use restriction. Ohio EPA will monitor the owner's adherence to the Environmental Covenant to ensure continued protection of human health and the environment.

The institutional control (Environmental Covenant) will prohibit the use of the shallow ground water across the entire facility. The assessment assumed there would be no human exposure to the ground water. Accordingly, Ohio EPA believes that human health will be protected if on-site use of the shallow ground water is prohibited. The assessment found that contamination in the shallow ground water is unlikely to migrate off the Reilly Tar property.

The site-wide institutional controls and physical barriers will prohibit excavation work at the facility property that would breach a two foot barrier, and prohibit construction of any type of building without satisfactory vapor intrusion controls. The Human Health Risk Assessment concluded that cancer risks of excavation workers at the facility property exceed Ohio EPA's cancer risk level of  $10^{-5}$ . The facility shall ensure through notice/notification means that utility and construction workers are aware of the site conditions. Therefore, Ohio EPA believes that human health will be protected if institutional controls are implemented.

The Environmental Covenant ensuring land use restrictions, the specified engineering isolation measures, and mandated environmental monitoring requirements designed to control the potential environmental risk of residual contamination, will be reflected on the land records and effectively inspected, maintained and enforced over time as a valid real property servitude assuring both short and long term reliability and effectiveness of the remedy.

DEC 16 2010

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## 5.0 CONCLUSIONS

In conclusion, as they meet the threshold criteria for remedy acceptability, Ohio EPA has selected each of the remedies discussed in Section 4.2., Ohio EPA's Evaluation of the Selected Remedies. In addition, the facility will continue to maintain the financial instruments required to cover all associated costs of the site, including design, installation and maintenance of the isolation barrier.



**Responsiveness Summary for Public Comments Received on the  
Statement of Basis for the Remediation of the Former Reilly Tar and  
Chemical Corporation Facility  
Cleveland, Ohio**

**Agency Contacts for this Project**

Division Contacts: Harry Courtright & John Palmer, Division of Hazardous Waste Management

Public Involvement Coordinator: Kristopher Weiss, (614)728-0047, [Kristopher.Weiss@epa.state.oh.us](mailto:Kristopher.Weiss@epa.state.oh.us)

Ohio EPA issued a Statement of Basis for the remediation of the Former Reilly Tar and Chemical Corporation Facility on September 29, 2009, commencing a 45-day public comment period which concluded on November 16, 2009. The Statement of Basis was made available for public review at the Ohio EPA - Northeast District Office, 2110 East Aurora Road, Twinsburg, Ohio and, Ohio EPA, 50 West Town Street, Suite 700, Columbus, Ohio. As Ohio EPA received comments during the comment period, a Responsiveness Summary has been prepared. The purpose of the Responsiveness Summary is to document the comments received during the public comment period, and Ohio EPA's responses to the comments.

After considering all comments received during the public comment period, Ohio EPA then issues a Decision Document formally selecting a remedy for this site.

On November 16, 2009, Excalibur Group, LLC submitted comments on behalf of Vertellus Specialties, Inc. (Vertellus) on the Statement of Basis for the Former Reilly Tar and Chemical Corporation, Cleveland, Ohio. The purpose of the Statement of Basis (SB) is to identify Ohio EPA's preferred remedies, explain the reasons for the selection of remedies and allows the property owner to institute corrective action activities at the site once a final decision is issued. The SB will not be modified, but rather all comments are considered in the context of determining the final remedy decision which will be identified in the Director's Decision Document. Ohio EPA has prepared the following response to comments that were submitted during the public comment period.

**Comment #1:**

*"Reference the first bullet on page 15:*

*...Vertellus intends to install an isolation barrier over former areas of operation for protection to human health via the elimination of exposure pathways. Furthermore, Vertellus does not intend to change the use of the property with the understanding that the long term use of the property would be controlled by the environmental covenants and deed restrictions on the property. Therefore, the following text is stricken and modified as shown in bold text to read:*

*In the event that outdoor storage areas preclude the use of soil or slag, asphalt may be the preferred approach for providing an isolation barrier. ~~Any areas where an asphalt or concrete cap is used in lieu of 2 feet of soil or slag, a construction, operation and maintenance plan must be submitted to Ohio EPA for approval. Additionally, financial assurance would have to be provided for any ongoing operation and maintenance.~~ Alternatively, where surface soils pose a direct exposure pathway, a suitable soil type and thickness will be proposed **for Ohio EPA approval as an isolation barrier** to promote the growth of vegetation."*

**Comment #4:**

*"Reference the last paragraph on page 16:*

*...Vertellus, the sole site owner of the property, was advised by Ohio EPA that a two-foot thick isolation barrier would serve two purposes: i) eliminate all risks; and ii) provide ample thickness that would require minimal maintenance and would preclude the necessity of an operation and maintenance plan. As the owner of the site, they have a vested interest in maintaining their asset in a general accordance with local ordinances. Between this phase of the process and when the corrective measures are implemented, Vertellus will endeavor to work with the Ohio EPA, as they have in the past, to develop common ground that is agreeable to all parties. Vertellus is amenable to the preparation and implementation of an operation and maintenance plan; however, Vertellus strongly suggests that the minimum financial assurance be required for the planned future use of the property described in the SB".*

*"Vertellus suggests the following text is stricken and modified as shown in bold text to read:*

*"Ohio EPA also proposes the development and approval of an operation and maintenance plan for all ~~"capped"~~ areas. **the isolation barrier to ensure that the proper barrier thickness is being maintained so that exposure pathways with***

~~*contaminated areas are incomplete. This would ensure the proper cap is being maintained so that exposure pathways with contaminated areas are incomplete.*~~

**Ohio EPA Response to Comments #1 and #4:** Comment #1 submitted by Excalibur Group, LLC (Excalibur), on behalf of Vertellus, suggested a language change in the SB which in effect eliminates the following elements of the State's preferred remedy: a construction, operation and maintenance plan (C,O&M plan) for the proposed isolation barrier; and providing financial assurance for any ongoing operation and maintenance.

Comment #4 did indicate that Vertellus is amenable to the preparation of an O&M plan but strongly suggests that the minimum financial assurance be required for the planned future use of the property described in the SB. Comment #4 also suggests language changes to replace the term "capped areas" with "isolation barrier".

Ohio EPA accepts the term "isolation barrier" for describing the remedy intended for cutting the direct contact pathway at the site. The placement of an isolation barrier is the recommended choice for cutting the direct contact pathway at the site. The site owner has the option of using different materials for the isolation barrier. Neither the final materials nor the details of the barrier construction will be defined until the construction work plan is submitted and approved by Ohio EPA. Ohio EPA must provide oversight of the remedy implementation and hence will require the submittal and approval of the C, O&M plan. The owner must provide that the type of barrier placed over the site remains in good condition and is maintained so that it performs to its intended engineered use. Financial assurance for the ongoing O&M and site monitoring costs will be required per Ohio Administrative Code Rule 3745-54-101(B) to ensure the remedy remains satisfactorily in place and performs as intended. The level of financial assurance required will be determined on the estimated costs of operating and maintaining the selected remedy for the planned future use of the property and for the limited monitoring of ground water and maintenance of down gradient monitoring wells.

In addition to the flexibility of isolation barrier materials, it has been determined that it is possible for more site uses (i.e. beyond storage of steel coil or other industrial materials) to be acceptable if additional engineering measures are provided. Satisfactory protective controls addressing vapor intrusion, including controls preventing vapor migration along any installed utilities allows potential site use including structures. Construction of any structure(s) must not result in a disturbance of or below the two foot isolation barrier. The Decision Document reflects these greater options for further site development with conditioned changes (e.g. structures with protective controls; Utilities remaining and work allowed with prior approval) to the restrictions to be incorporated in the Environmental Covenant. Ohio EPA review of the C, O&M plan and ongoing oversight of the facility and site development/use will also occur.

**Comment #2:**

“Reference the fifth paragraph on page 16:

*... : Based on the planned use of the property, Vertellus intends to properly abandon all onsite wells because the planned site activities include storage of heavy materials, movement of heavy machinery, movement of heavy trucks, and all of these activities may take place in all forms of weather. Under these conditions, it is unlikely that any protective structure could be erected to withstand impacts and also ensure the integrity of wells. Therefore, the following text may be stricken and modified as shown in bold text to read:*

~~“Ohio EPA proposes proper monitoring well abandonment of onsite wells which could be compromised by the anticipated use. The proposed outdoor storage activities would incorporate heavy machinery and truck traffic. This traffic could damage the above grade monitoring wells. The facility may alternatively choose to keep the wells in place and engineer a protective structure around the well head to insure it will not be compromised. ”~~ **“Ohio EPA proposes proper monitoring well abandonment of onsite wells.”**

**Comment #3:**

“Reference the sixth paragraph on page 16:

*“...Vertellus, the sole owner of the property intends to install an isolation barrier over former areas of operation for protection to human health via the elimination of exposure pathways. Vertellus does not intend to change the use of the property and understands that the long term use of the property would be controlled by the environmental covenants and deed restrictions on the property. As stated in the fifth paragraph on Page 16, proper monitoring well abandonment of onsite wells is proposed by Ohio EPA due to the anticipated use of the site. Further, the human health risk assessment presented in the Final RCRA Facility Investigation Report presented in December 2008 provided a quantitative analyses, in a conservative manner, of the likely adverse health effects that could be associated with potential exposures to constituents in groundwater. It was determined that groundwater is not used for drinking and constituents of concern (COC) identified in groundwater posed the potential for vapor intrusion. Additionally, COCs were evaluated for their potential pathways to migrate to surface water. There were no constituents identified as having the potential to migrate from groundwater to surface water of the Cuyahoga River at concentrations exceeding applicable human health or aquatic life water quality criteria. Based on the conclusions of the risk assessment, as long as the*

*isolation barrier attains a thickness of two-feet, all risks are eliminated and a monitoring program is not necessary.”*

*“As part of the planned activities associated with the installation of the isolation barrier, Vertellus intends to properly abandon all onsite wells (see Comment #3) and therefore requests that this paragraph be removed:*

*~~Ohio EPA proposes proper maintaining and yearly sampling of down gradient monitoring wells. Down gradient monitoring wells should be left in place and entered into an ongoing operation and maintenance plan. This plan would need to be developed and approved by Ohio EPA. Included in the plan would be action detection limits for the down gradient wells.”~~*

**Ohio EPA Response to Comments #2 and #3:** Excalibur, on behalf of Vertellus, suggested a language change in the SB which in effect would remove the ground water monitoring element of the State’s preferred remedy. There is agreement between Vertellus and Ohio EPA that most of the monitoring wells on the property should be properly abandoned. However, Vertellus states that “based on the conclusion of the risk assessment, as long as the isolation barrier attains a thickness of two-feet, all risks are eliminated and a monitoring program is not necessary.” While Ohio EPA similarly concludes that implementation and maintenance of the preferred remedy should satisfactorily meet the Corrective Action threshold criteria of being protective of human health and the environment, Ohio EPA maintains that periodic sampling of the down gradient monitoring wells is necessary to detect any changes in the plume of contamination. Ohio EPA is amenable to discussing monitoring frequency. A ground water monitoring plan should be included in the C, O&M plan and be a part of the implementation of corrective action remediation activities.

**End of Responsiveness Summary**