



State of Ohio Environmental Protection Agency

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**Re: Owens Corning Science & Technology
EPA ID # OHD 039 992 516
Decision Document of Corrective Action**

August 29, 2008

Owens Corning Science & Technology Facility
Attn: Mr. Don Hurd
2790 Columbus Road
State Route 16
Granville, Ohio 43023

Dear Mr. Hurd:

Here is the final Declaration and Decision Document for the Owens Corning Science & Technology Facility property in Granville, Ohio. Staff at Ohio EPA, Division of Hazardous Waste Management (DHWM), has reviewed Owens Corning's final RCRA Facility Investigation (RFI) Report submitted for the property and issued a Statement of Basis seeking public input on the proposed remedies. The Agency received written comments concerning the Statement of Basis and these comments were addressed in the responsiveness summary.

Since the proposed remedies appear to comply with applicable hazardous waste rules, the Declaration and Decision Document represents the selected remedies for the Owens Corning Science & Technology Facility, in accordance with the policies of Ohio EPA and the statutes and regulations of the State of Ohio.

In accordance with the Conclusions section presenting the remedy summaries, use or portions of the site (waste management unit (WMUs) 7, 8, and 9) will be restricted from residential and/or public access, and groundwater will be restricted from use as drinking water to a depth of forty (40) feet below ground surface for the whole facility with implementation of an environmental covenant. Also, an Operations and Maintenance (O&M) Plan will be developed for the purposes of long-term groundwater monitoring, to ensure the continued integrity of the two (2) on-site landfills (WMUs 8 and 9), the groundwater interceptor system located between WMUs 8 and 9, and the wastewater treatment system (WMU 7), and to document control and use of the WMU 28 area.

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

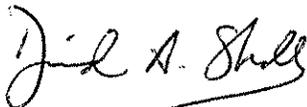
Owens Corning Science & Technology Facility
Mr. Don Hurd
August 29, 2008
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You are hereby notified that this action of the Director is final and may be appealed to the Environmental Review Appeals Commission pursuant to Section 3745.04 of the Ohio Revised 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 Randy Sheldon of Ohio EPA's Central District Office at (614) 728-5037.

Sincerely,



David A. Sholtis, Assistant Chief
Division of Hazardous Waste Management

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cc: Edwin Lim/Jeremy Carroll, ERAS, DHWM, CO
Erik Hagen, ERAS, DHWM, CO
Steve Rath/Randy Sheldon, DHWM, CDO
Carol Hester, PIC
DHWM, CDO File
file

PUBLIC NOTICE

Licking County

OHIO EPA ISSUES DECLARATION AND FINAL DECISION DOCUMENT FOR OWENS CORNING SCIENCE & TECHNOLOGY FACILITY

On August 29, 2008, Ohio EPA issued a Declaration and final Decision Document to the Owens Corning Science and Technology Facility (Owens Corning) located at 2790 Columbus Road, State Route 16, Granville, Ohio 43023. The EPA Identification Number for this facility is OHD039992516.

Why does Owens Corning need a final Decision Document?

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

Owens Corning will assume clean-up responsibilities at the Granville facility site and agreed to negotiate implementation orders to address its corrective action obligations.

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 October 1, 2008. 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.

OHIO EPA

Division of Hazardous Waste Management

Final Response Summary

Project: Owens Corning Science & Technology Facility
Ohio EPA ID #: OHD039992516

Agency Contacts for this Project

Division Contact: Randy Sheldon, Division of Hazardous Waste Management, 614-728-5037, randy.sheldon@epa.state.oh.us

Public Involvement Coordinator: Jed Thorpe, Public Interest Center, 614-644-2160, jed.thorpe@epa.state.oh.us

Ohio EPA held a public comment period beginning on May 8, 2008 regarding issuance of a Statement of Basis for Preferred Remediation at the Owens Corning Science & Technology Facility located near Granville, Ohio. Owens Corning submitted the only comments received in regards to the above action. This document summarizes Owens Corning's comments received during the associated comment period, which ended on June 23, 2008.

Ohio EPA reviewed and considered all comments received during the public comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health. Often, public concerns fall outside the scope of that authority. Ohio EPA may respond to those concerns in this document by identifying another government agency with more direct authority over the issue.

In an effort to help you review this document, the questions are grouped by topic and organized in a consistent format.

Figure 1 (Section 4.1)

Comment 1: This Section of the Report lists the 32 WMUs and one AOC but references a Figure 1 that only show the WMUs/AOCs that were investigated in the RFI. Please replace Figure 1 with a figure that shows all of the WMUs/AOC (e.g., Figure 3 in the RFI Work Plan).

Response 1: Figure 3 of the approved RFI Work Plan that lists all of the identified WMUs/AOC has replaced the previous figure identified as Figure 1, as requested.

Screened WMUs (Section 4.6)

Comment 2: This Section of the Report discusses the initial Waste Management Units ("WMU") and Areas of Concern ("AOC") screening phase to determine whether further investigation of each of those units was warranted. It describes how that screening was accomplished but does not report on the results of that screening process. OC suggest the Agency consider adding a sentence to this section of the Report that identifies the percentage of the WMUs and AOCs that were resolved through this initial screening process and not carried through formal assessment.

Response 2: The following sentence has been added to this section, as requested: "Of the thirty-three (33) WMUs/AOC identified at the facility, fifteen (15) or forty-five percent (45%) were resolved through this initial screening process and not carried through the formal assessment."

Term Reference (Section 4.7.3.b)

Comment 3: In the second paragraph, line 8, the term "SMU-27-SD2" should be replaced with "WMU27-SD2."

Response 3: The referenced term has been replaced with "WMU27-SD2," as requested.

Landfill Caps (Sections 4.7.11-Table & 4.7.12-Table)

Comment 4: OC suggests that Item No. 3 in the column of the table appearing in this section entitled "Environmental Concerns based on Investigation" be changed from "Informal, old cap design with no bottom liner" to read "Formal RCRA cap design with no bottom liner."

Response 4: With respect to the suggested change offered by OC, the following statement has replaced the former language in the specified column of the table: "Engineered clay cap with no bottom liner."

Comment 5: OC suggests that Item No. 2 in the column of the table appearing in this section entitled "Environmental Concerns based on Investigation" be changed from "Informal, old cap design with no bottom liner" to read "Formal RCRA cap design with no bottom liner."

Response 5: With respect to the suggested change offered by OC, the following statement has replaced the former language in the specified column of the table: "Engineered clay cap with no bottom liner."

WMU 27 (Section 4.7.30-Table)

Comment 6: Item No. 9 in the column of the table appearing in this Section entitled "Investigation Activities and Results" states "Area of unit not intended for residential use." That language may be read to suggest that WMU 27 is subject to this land use restriction. Based on the screening level human health risk assessment and the release assessment there are no significant impacts to the environment and a release did not occur at WMU 27. The Report clearly states that the land use restrictions apply only to WMUs 7, 8 and 9. (See statements at the bottom of page 12, to of page 76, Section 5.4.22 and Section 6.0 the Summary of Ohio EPA's Preferred Remedies and specifically the paragraph headed "Land Use Restrictions.") As such, this entry in the table should be deleted.

Response 6: The referenced entry to the table has been deleted, as requested. Also deleted was the next-to-last sentence of Section 4.7.30, Sediment, third paragraph, page 57, which read, "Land use in this area of the facility is not expected to change and is under the control of Owens Corning."

Typo & Control of WMU 28 (Section 4.7.31)

Comment 7: The fourth sentence of the first paragraph reads "The system operated from the time Building 75 was built in the early 1960s until the mid 1990s when waste a waste discharge line from Building 75 was connected to the wastewater treatment plant." OC suggests that the first "waste" be deleted from this sentence.

Response 7: The referenced word has been deleted, as requested.

Comment 8: The fifth paragraph of this Section, at the bottom of page 59 states in part "However, the potential impact to human health and/or the environment is unlikely based on the facts that no one resides/is intended to reside on this portion of the facility, bedrock is encountered prior to a saturated zone sufficient for potable use, and a facility-wide groundwater use restriction for use as a drinking water to a depth of forty (40) feet will be completed." This language could be read to suggest that this portion of the property is subject to a restricted land use. This interpretation is reinforced by language appearing in the table on page 60 of the Report. Item No. 8 in the Column entitled "Investigation Activities and Results" reads, "Area of

unit not intended for residential use.” The Report clearly states that the land use restriction apply only to WMUs 7, 8 and 9. (See statements at the bottom of page 12, top of page 76, Section 5.4.22 and Section 6.0 the Summary of Ohio EPA’s Preferred Remedies and specifically the paragraph headed “Land Use Restrictions.”) As such, the underlined portion of the sentence at the bottom of page 59 and Item No. 8 in the table should be deleted. These changes are consistent with the statement in this Section of the Report immediately above the table which reads, “Based on the analytical results and observations, and with implementation of the groundwater use restriction, it has been determined that WMU 28 is not potentially significant source of contamination and no further action is required.”

Response 8: With respect to Owens Corning’s comment, as found in the fifth paragraph of Section 4.7.31, pages 59 and 60, when the arsenic and chromium concentrations found in soil were compared to background concentrations; the statistical analyses indicated that the mean concentrations for each constituent were both significantly higher than the mean background concentrations. Only arsenic was found to be greater than the direct contact risk benchmark, as chromium was found to be greater than the leaching to groundwater benchmark. The arsenic 95% upper confidence limit value for a t-distribution (30.64 mg/kg) was found to be less than the established industrial use cancer and non-cancer risk benchmarks. It was observed and determined that while this WMU area remains under the control of Owens Corning and no one is residing on the specified area, any potential risk pathways would be eliminated or extremely limited. Therefore, as long as the WMU 28 area remains under the control of Owens Corning (i.e., facility guards, facility fencing, etc.), it has been determined that no additional assessment and/or remediation are necessary. Should Owens Corning ever wish to relinquish oversight/control of the WMU 28 area and/or ever wish to allow someone to reside on the area of the unit, notification to Ohio EPA of Owens Corning’s intentions and reassessment of the unit will be necessary at that time. Any reassessment will be limited to identifying, what, if any, actions will be needed with respect to the arsenic present in the soil at WMU 28. If Owens Corning wishes to develop the WMU 28 area for commercial or industrial use, Ohio EPA must be notified but Ohio EPA will not require further investigation or remediation of the WMU 28 area.

The following symbol and wording have been removed from the last sentence appearing on page 59: “.../is intended to reside...”

The following sentences have been added to the end of the first paragraph on page 60: “Should Owens Corning ever wish to relinquish oversight/control of the WMU 28 area or wish to allow someone to reside on the area of the unit, notification to Ohio EPA of Owens Corning’s

intentions and reassessment of the unit will be necessary at that that time. Any reassessment will be limited to identifying, what, if any, actions will be needed with respect to the arsenic present in the soil at WMU 28. If Owens Corning wishes to develop the WMU 28 area for commercial or industrial use, Ohio EPA must be notified but Ohio EPA will not require further investigation or remediation of the WMU 28 area.”

WMU 28 Table, item 8) of the column entitled, “Investigation Activities and Results” has been changed to read: “Area under control of Owens Corning.” The column entitled, “Ohio EPA Proposed Remedy to Address Concerns” has the additional items that read: “2) If control of unit to be relinquished and/or changed to residential use, Ohio EPA to be notified prior to desired change(s) for reassessment of unit; 3) Any reassessment will be limited to the arsenic present in the soil at WMU 28; 4) If Owens Corning determines to develop the Unit for commercial or industrial use it will be necessary to notify Ohio EPA but no further investigation or remediation will be required.”

WMU 29 (Section 4.7.32-Table)

Comment 9: Item No. 8 in the column of the table appearing in this Section entitled “Investigation Activities and Results” states “Area of unit not intended for residential use.” That language may be read to suggest that WMU 29 is subject to this land use restriction. Based on the screening level human health risk assessment and the release assessment there are no significant impacts to the environment and a release did not occur at WMU 29. The Report clearly states that the land use restrictions apply only to WMUs 7, 8 and 9. (See statements at the bottom of page 12, top of page 76, Section 5.4.22 and Section 6.0 the Summary of Ohio EPA’s Preferred Remedies and specifically the paragraph headed “Land Use Restrictions.”) As such, this entry in the table should be deleted.

Response 9: The referenced entry to the table has been deleted, as requested.

Control of WMU 28 (Section 5.3.9)

Comment 10: This Section of the Report addresses WMU 28 and again may be read to suggest that a land use restriction is applicable to this WMU. Specifically the second to last sentence in the paragraph reads, “However, the potential impact to human health and/or the environment is unlikely based on the facts that no one resides/is intended to reside on this portion of the facility, bedrock is encountered prior to a saturated zone sufficient for potable use, and a facility-wide groundwater use restriction for use as drinking water to a depth of forty (40) feet will be

completed.” To be consistent with previously recommended changes in Section 4.7.31 regarding this WMU, that sentence should be changed to read, “However, the potential impact to human health and/or the environment is unlikely based on the fact that bedrock is encountered prior to a saturated zone sufficient for potable use, and a facility-wide groundwater use restriction for use as drinking water to a depth of forty (40) feet will be completed.”

Response 10: With respect to Owens Corning’s comment, the following symbol and wording have been removed from the identified sentence in Section 5.3.9: “.../is intended to reside...” Also, the following sentences have been added to Section 5.3.9: “Therefore, as long as the WMU 28 area remains under the control of Owens Corning (i.e., facility guards, facility fencing, etc.), it has been determined that no additional assessment and/or remediation are necessary. Should Owens Corning ever wish to relinquish oversight/control of the WMU 28 area and/or ever wish to allow someone to reside on the area of the unit, notification to Ohio EPA of Owens Corning’s intentions and reassessment of the unit will be completed at that time. Any reassessment will be limited to identifying, what, if any, actions will be needed with respect to the arsenic present in the soil at WMU 28. If Owens Corning wishes to develop the WMU 28 area for commercial or industrial use, Ohio EPA must be notified but Ohio EPA will not require further investigation or remediation of the WMU 28 area. This requirement will be a part of the facility’s O&M plan.”

The following language has been added to Section 6.0 as the next-to-last sentences of the Operations and Maintenance Plan paragraph on page 91: “Periodic documentation regarding Owens Corning’s control of and/or current land use of the WMU 28 area will be completed. Should Owens Corning ever wish to relinquish control of and/or allow some one to reside on the WMU 28 area, notification to Ohio EPA of Owens Corning’s intentions and reassessment of the unit will be completed at this time. Any reassessment will be limited to identifying, what, if any, actions will be needed with respect to the arsenic present in the soil at WMU 28. If Owens Corning wishes to develop the WMU 28 area for commercial or industrial use, Ohio EPA must be notified, but Ohio EPA will not require further investigation or remediation of the WMU 28 area.”

End of Response to Comments

DECLARATION

OHIO E.P.A.

AUG 29 2008

SITE NAME AND LOCATION

Owens Corning Science & Technology Facility
2790 Columbus Road, St. Rt. 16
Granville, Ohio
Licking 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: M. Shapiro Date: 8/29/08

This Decision Document presents the selected remedies for the Owens Corning Science & Technology Facility in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio. This Decision Document also represents Ohio EPA's approval of the Work Plan submitted by the facility.

ASSESSMENT OF THE SITE

Owens Corning has completed extensive soil, sediment, groundwater, surface water, biota and fish tissue investigations in and around areas of the facility that were potentially affected by previous waste management practices. Investigation results indicated that potential risks were associated with the presence of the on-site wastewater treatment system (waste management unit (WMU) 7) and the two (2) on-site landfills (WMUs 8 & 9). Potential risks were also identified with WMU 28 should control and/or current land use change. Ohio EPA found that the implementation of the selected remedies will protect public health and the environment by permanently limiting and/or eliminating risk pathways for any applicable receptors.

DESCRIPTION OF THE SELECTED REMEDIES

The selected remedies will include:

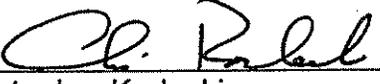
- Site-Wide Groundwater Use Restriction
A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet below ground surface will be implemented through completion of an environmental covenant. This use restriction will cover all of the property at the facility currently owned and managed by Owens Corning. This restriction was necessary due to elevated excess lifetime cancer risks (ELCRs) and non-cancer hazard indexes (HIs) for the protection of groundwater at the facility, specifically for WMUs 4, 7, 8, 9, 14, 15, 22, 28, and 31. The environmental covenant runs with the land and is binding upon existing and any future property owner, should the land be sold. Ohio EPA will monitor the property owner's adherence to the environmental covenant.

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- Land Use Restrictions
Land use restriction will be implemented through completion of an environmental covenant(s). The areas surrounding WMUs 7, 8, and 9 will be restricted from residential and/or public access. The environmental covenant(s) runs with the land and is binding upon existing and any future property owner, should the land be sold. Ohio EPA will monitor the property owner's adherence to the environmental covenant(s).
- Operation and Maintenance Plan
An Operations and Maintenance (O&M) Plan will be completed and submitted to Ohio EPA for review and acceptance. The plan will include long-term groundwater monitoring in the areas near WMUs 7, 8, and 9, as well as monitoring the groundwater coming onto the site and leaving the site. The plan will include mechanisms for maintaining the integrity of the wastewater treatment system (WMU 7), the two (2) on-site landfills (WMUs 8 and 9), and the groundwater interceptor system located between WMUs 8 and 9. The plan will also include stipulations regarding periodic documentation associated with control of and land use of the WMU 28 area, with notification to Ohio EPA and possible reassessment should there be any desired changes to the control/uses of the WMU area. Ohio EPA will monitor the property owner's adherence to the O&M Plan.
- Removal of Mt. St. Helen's Ash
Drums of Mt. St. Helen's Ash were removed from Pond D and/or WMU 13. The pond was drained and the containers of Mt. St. Helen's Ash were removed. Analytical results of the ash indicated it was not a hazardous waste and in fact was found to be very similar to naturally occurring soils. The pond was allowed to refill and habitat common to the area and pond has re-established.

STATUTORY DETERMINATIONS

Today's selection and required implementation of the listed remedies are protective of human health and the environment, are in accordance to applicable State and federal laws, and are responsive to public participation and input. These remedies utilize, to the maximum extent practicable, permanent solutions in limiting and/or eliminating risk pathways for any applicable receptors. The effectiveness of the remedies will be reviewed regularly.



Christopher Korleski
Director

Date 8/21/08

OHIO EPA DHWM

AUG 29 2008

Decision Document for Selected Remedies at the
Owens Corning Science & Technology Facility
Granville, Ohio
Licking County
OHD 039 992 516

Prepared By
The Ohio Environmental Protection Agency
August 2008

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1.0 INTRODUCTION

1.1 Executive Summary

Ohio EPA issued a Statement of Basis for Owens Corning's Granville facility on May 7, 2008 identifying the Agency's preferred remedies for addressing any environmental contamination discovered by the investigation, explains the reasons for selection of the remedies, solicits public review and comment and provides information on how the public can be involved in the final remedy selection process.

This document was made available to the public at the **Granville Public Library** and at **Ohio EPA's Central District Office** for review during the formal comment period of May 8, 2008 to June 23, 2008. Ohio EPA received comments from Owens Corning.

The Ohio Environmental Protection Agency (Ohio EPA) has prepared this final Decision Document for Selected Remedies at the Owens Corning Science & Technology (Owens Corning) facility in Granville, Ohio. This final Decision Document identifies Ohio EPA's selected remedies and explains the reasons for the selection of the remedies.

In accordance with October 31, 2000 Final Findings and Orders, Owens Corning has completed extensive soil, sediment, groundwater, surface water, biota and fish tissue investigations in and around areas of the facility that were potentially affected by previous management practices. Ohio EPA has reviewed Owens Corning's document submissions and comments received during the public comment period, and today is issuing this final Decision Document. In brief, the agency proposes to restrict groundwater for drinking water use to a depth of forty (40) feet below land surface; proposes to restrict land use in specified areas; and proposes the development of a long-term Operations and Maintenance (O&M Plan) that would include groundwater monitoring and specified documentation/reporting.

1.2 How the Corrective Action Process Works

The initial step in every corrective action process for facilities regulated under the Resource Conservation and Recovery Act (RCRA) is site characterization or investigation to define the nature and extent of contamination at the facility. The information collected will support selection and implementation of a remedy or remedies or, if necessary, interim measures. This step culminates with the facility's submission of the RCRA Facility Investigation (RFI) Report to Ohio EPA.

Interim measures or actions are activities put into place to control or abate ongoing risks to human health and the environment which are discovered during the course of the investigation. Interim measures are taken in advance of final remedy selection for the purpose of preventing further environmental degradation during completion of the

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investigation and final remedy selection phases of corrective action. Interim measures are identified and noted in the RFI report.

Upon completion of the investigation, the facility provides Ohio EPA with its proposed remedies. Ohio EPA may decide to tentatively approve a proposed remedy, tentatively select a different remedy, or require additional analysis of remedial alternatives. Ohio EPA presents its preliminary decision on remedy selection for public comment by issuing a Statement of Basis. Following public review, Ohio EPA responds to comments received and issues a final decision regarding final remedy selection. The facility is required to implement the selected remedies.

2.0 PUBLIC INVOLVEMENT

The actual approval of the RFI Report and selection of the final remedies has been made only after the comments received during the public comment period were reviewed and analyzed. Ohio EPA considered all public comments in regards to the Statement of Basis in preparing this final Decision Document. All written comments received during the public comment period have been summarized and are addressed in the Responsiveness Summary of the final Decision Document.

Prior to Ohio EPA approving the RFI Report and selecting the final remedies, there was a forty-five (45) day public comment period when the public had the opportunity to voice their comments on the RFI report and the proposed remedies. The public comment period was announced in a local newspaper.

The documents which have been submitted to Ohio EPA on this matter by Owens Corning are available for review by the public at Ohio EPA's Central District Office, Division of Hazardous Waste Management, 50 West Town Street, Suite 700, Columbus, Ohio. Please call Lisa Oltman at 614-728-0793 to make an appointment to review these records.

3.0 SITE BACKGROUND

The Owens Corning Science & Technology facility is located at 2790 Columbus Road, State Route 16, Granville, Licking County, Ohio. The facility occupies approximately 526 acres and is bordered on the north by State Routes 37 and 161, on the east by open fields, on the south by State Route 16, and on the west by Raccoon International Golf Course and open fields. The facility is Owens Corning's primary research and development center. Work activities at the facility focus on asphalt, composite, and insulation products, and include developing new products and processes, analyzing materials, developing formulations, and evaluating product performance. The facility consists of twenty (20) main buildings that have a total area of approximately 640,000

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square feet. The buildings house approximately twenty-four (24) wet chemistry laboratories, open work areas for prototype and pilot equipment, and office space. See Figure 1.

In October of 2000, Owens Corning and Ohio EPA agreed to Final Findings and Orders, wherein Owens Corning agreed to conduct corrective action at the facility. Based on the results of a thorough investigation of the facility, corrective action generally requires the clean-up of contaminated areas for the purpose of reducing risks to human health and the environment. The corrective action process involves several key elements, each of which help to gather information necessary to support good clean-up decisions, and consists of, among other things, a RFI, a corrective measures study (if needed), interim measures implementation, and corrective measures or remedy implementation.

4.0 RFI REPORT

4.1 Investigation Summary

Owens Corning conducted a RFI at its Granville, Ohio location under the oversight of Ohio EPA. The investigation was conducted in accordance with requirements established in the Findings and Orders and the approved RFI Work Plan dated November 2002. The investigation was a thorough evaluation of environmental conditions at the site, including a risk-based analysis of sampling results obtained for identified constituents of concern. The RFI Report summarizes the results of the site investigation.

During the RFI, Owens Corning examined the chemical and physical nature of background media in soil, sediments, surface water, and groundwater. These background samples were collected in areas of Owens Corning's property that are unlikely to have been influenced by facility operations.

The RFI focused on thirty-two (32) waste management units (WMUs) and one (1) area of concern (AOC) whose locations are found in Figure 1. Soil, sediment, surface water, and/or groundwater were investigated at each WMUs/AOC as applicable. Site-wide surface water, groundwater, and sediments were also evaluated. The WMUs and AOC are as follows:

- WMU 1 – Current <90 Day Container Storage Area
- WMU 2 – Suspected Burial Site Consisting of an Outdoor Area Located Between the Current <90 Day Container Storage Area and the Weathering Farm Landfill
- WMU 3 – Area Where Wastes Were Reportedly Stored Along a Treeline Just North of the Current <90 Day Container Storage Area
- WMU 4 – Former Interim <90 Day Container Storage Area
- WMU 5 – Hazardous Waste Satellite Accumulation Areas
- WMU 6 – Non-Hazardous Waste Accumulation Areas

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- WMU 7 – Wastewater Treatment and Sewerage System
- WMU 8 – The Weathering Farm Landfill
- WMU 9 – The Test Homes Landfill
- WMU 10 – Suspected Burial Site Near the Southeast Corner of the Test Homes Landfill
- WMU 11 – Suspected Burial Site Near the Electrical Substation (a.k.a. Miscellaneous Burial Site C)
- WMU 12 – Former South Quarry Area
- WMU 13 – Mt. St. Helen's Ash Disposed of in the Southwestern Quarry Ponds
- WMU 14 – Small Concrete Tank Testing Pit
- WMU 15 – Small Former Quarry Excavation About 150 Feet Northeast of Current Paper Incinerator
- WMU 16 – Old Incinerator Which was Located Between the Center and Southern Quarry Ponds on the East Side of the Quarry Road
- WMU 17 – Underground Storage Tanks (USTs) at Building 11
- WMU 18 – USTs at Building 22
- WMU 19 – UST at Building 53
- WMU 20 – USTs at Building 60
- WMU 21 – UST at Building 61
- WMU 22 – UST at Building 71
- WMU 23 – UST at Building 72
- WMU 24 – UST at Building 73
- WMU 25 – UST at Building 75
- WMU 26 – Current Paper Incinerator
- WMU 27 – Building 20 to 22 Complex-Former Neutralization Basin to Include the Basin to Include the Basin, Lines, and Ravine
- WMU 28 – Septic Tank and Leach Well for Building 75
- WMU 29 – Septic Tank and Leach Well for Building 76
- WMU 30 – Ravine East of Building 75 Where the Drain Line from this Building Formerly Discharged
- WMU 31 – Fuel Oil USTs
- WMU 32 – USTs at the Former Granville Aggregate Building
- AOC 1 – Former Tank Testing Area

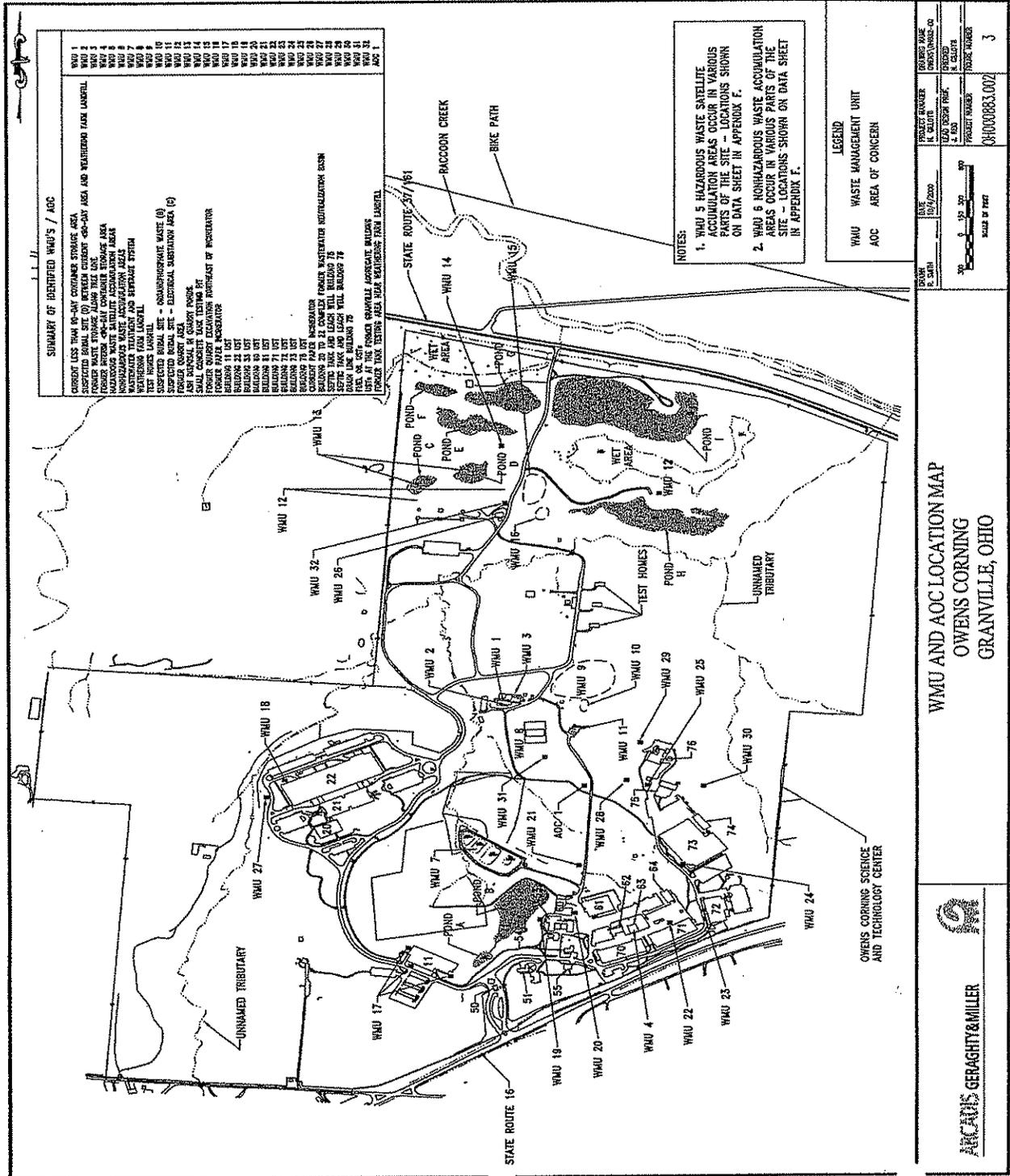


Figure 1: Site Map of Owens Corning Science & Technology, Granville, Ohio

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4.2 Characterization of Environmental Setting

The site investigation indicates that the facility is located within the Till Plains Physiographic Region in central Ohio and specifically within the Gallion Glaciated Low Plateau province. The area is characterized by rolling uplands between the gently rolling Till Plains region and the more hilly Glaciated Allegheny Plateau Region to the east. The area is mantled with thin to thick glacial till and drift. The land surface elevation ranges from 1,120 feet above mean sea level (msl) at the southern portion of the property to 910 feet msl at the northern property boundary where the land surface slopes downward toward Raccoon Creek. The terrain surrounding the facility property consists of farmland and wooded hills. The facility is located directly south of Raccoon Creek, which recharges the underlying sand and gravel buried valley aquifer, located in the creek's floodplain. Soils at the southern and central portions of the facility are identified in the *Licking County Ohio Soil Survey (USDA 1992)* as part of the Centerburg-Amanda Association and have gently sloping to very steep, well drained soils. Along the quarry pond area and northern property boundary, the soils are part of the Ockley-Stonelick-Shoals Association and typically have nearly level to sloping, well drained to poorly drained soils deposited on outwash terraces and floodplains.

4.3 Characterization of Regional Geologic and Hydrogeologic Setting

The facility lies within a ground and end moraine area of the Wisconsin glacial stage. Prior to glaciation, Licking County was drained by two major tributaries of the Teays River, each having tributaries that may have drained the subject property. The drainage system was blocked by the advancement of glacial ice, creating several large lakes, cutting new drainage channels, and evolving new drainage systems (*Ohio Department of Natural Resources [ODNR] 1995*). The down cutting occurred at Granville and was later in-filled by deposits from the tributary that closely followed the course of the present-day Raccoon Creek. Deposits of ground moraine at the site overlay bedrock of the Mississippian age Cuyahoga Formation. The glacial deposits are primarily derived from the underlying bedrock. The bedrock was formed from Mississippian sediments composed of fine silts and muds that translated into the sandy shales, shales, siltstones, and fine-grained sandstones presently observed in the area around the site.

Based upon studies of the bedrock in central Ohio and in Licking County (*Holden 1942*), the Granville Shale facies of the Cuyahoga Formation is present beneath much of the facility, consisting of the Raccoon shale and the Black Hand sandstone members. Sandstone was observed from 10 to 50 foot depths in several borings drilled as part of the RFI and is deeper in the northern portion of the property in the vicinity of Raccoon Creek. The Black Hand sandstone is cemented primarily by the iron oxide minerals limonite and hematite, which create its well-known honeycomb weathering pattern in outcrops elsewhere in the county and state (*Pinker 1970*).

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In 1995, ODNR performed a study to determine the groundwater pollution potential of Licking County (ODNR 1995). This study indicated that the southern two-thirds of the subject property has clay rich glacial till that overlies bedrock with relatively low groundwater pollution potential. The northern portion of the property was characterized as a buried valley with moderate to high groundwater pollution potential.

Groundwater from Licking County is obtained from both glacial deposits and bedrock (ODNR 1995). Wells completed in glacial deposits are more common in areas where buried valleys have been filled in by the more clay-rich glacial deposits. Where glacial deposits are thin and composed primarily of fine-grained materials such as clay, wells are generally completed in bedrock. In the area near the facility, wells are completed in both glacial deposits and bedrock. The highest concentration of wells near the facility is to the south and southeast, hydraulically upgradient of the facility, where there is a concentration of private residences. These off-site wells are generally completed in bedrock. There are also some wells located northeast and to the north of Raccoon Creek, where homes and businesses on the outskirts of Granville have private wells. No water supply wells are located at the facility.

Granville, located approximately 1.5 miles east-northeast of the facility, provides city water to residences and businesses, including Owens Corning, but connection to the public water supply is not mandatory outside the city limits. The nearest water supply wells are two wells located approximately 600 feet northwest of the facility at the Raccoon International Golf Course. These wells are completed in the buried valley aquifer near Raccoon Creek, at depths of 54 feet and 78 feet. The deeper well was tested in 1992 for VOCs, SVOCs, metals, alkalinity, nitrate, sulfate, chloride, fluoride, and alpha and beta radiation. The only compound identified above levels of concern was chloroform with a concentration of 7.87 microgram per liter (ug/L).

Owens Corning reviewed the *Ohio EPA Drinking Water Source Assessment for the Village of Granville* (Ohio EPA, 2002). A portion of the facility is located within the outer protection zone of the drinking water source protection area for the Village of Granville public water system. The approximate distance of the facility included in this zone is 1,400 feet south of the northern property boundary. WMUs 12 and 14 are located within this zone.

4.4 Characterization of Site-Specific Hydrogeology Setting

Saturated sand or sandy units in the vicinity of the landfills are typically thin and laterally discontinuous. The central portion of the facility contains primarily clayey material with local thin, discontinuous sand or gravelly lenses, while the northern portions of the property were excavated and used in the construction of Routes 37 and 161 in the 1960's and 1970's. The excavation produced several man-made ponds on the northern

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portion of the property. The transition from predominately clay deposits in the southern and central portion of the property occurs in the vicinity of the ponds and WMU 12.

4.5 Characterization of Groundwater Flow

The site-wide groundwater flow direction was consistent for the seasonal gauging events with the direction of groundwater flow from the southwest to the northeast toward Raccoon Creek. There is slight groundwater mounding in the vicinity of the Weathering Farm and Test Homes landfills. It should be noted that because the saturated zones are laterally discontinuous, the monitoring wells are completed in different zones and the hydraulic gradients calculated between wells are not from the same permeable zones throughout the southern two-thirds of the site.

4.6 WMU and AOC Phase I Screening

The RFI Work Plan specified a “phased approach” for the investigation. As a part of the RFI Work Plan, initial WMU/AOC screening (Phase I) was completed. The initial determination of whether a WMU or AOC required further investigation was based on three considerations:

1. Whether hazardous constituents were managed at the WMU or AOC;
2. Whether sufficient evidence of a release of hazardous constituents exists; and
3. Whether potentially significant levels of released hazardous constituents exist in the environment.

A “yes” under all three considerations would support a determination that a WMU/AOC constitutes a potentially significant source and further investigation would be warranted. Another consideration is whether sufficient documentation is available to evaluate if a release has occurred. Further action may be warranted if insufficient records were kept. If screening criteria are exceeded at a WMU/AOC, then additional investigation would be warranted to fully characterize the nature and extent of contamination, as necessary to support the risk assessments. Of the thirty-three (33) WMUs/AOC identified at the facility, fifteen (15) or forty-five percent (45%) were resolved through this initial screening process and not carried through the formal assessment.

4.7 Human Health & Ecological Screening Risk Assessments

The RFI was completed and the results were used to determine the nature and extent of potential releases of constituents at thirty-two (32) WMUs and one (1) AOC where wastes were managed or disposed on-site. Owens Corning performed screening risk assessments to characterize the current and potential threats to human health and the environment that may be posed by constituents in soil, sediment, surface water, and groundwater. In addition to the WMU/AOC-specific investigations, groundwater, surface water, and sediment samples were also collected and evaluated on a site-wide basis to

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assess the potential risks to human health and the environment. Supplemental sediment and biota (benthic invertebrates, fishes) samples were also collected and analyzed. The focus of the screening level risk assessments was to evaluate potential risks and hazards based on comparison of the WMU/AOC-specific and site-wide data to the generic risk clean number (RCNs), under a residential scenario. The primary purpose of the screening risk assessments are to provide Agency risk managers with an understanding of the actual and potential risks and hazards to human health and the environment posed by the site and any uncertainties associated with the assessments. This information is useful in determining whether current or potential threats to human health and/or the environment exist that warrant remedial action.

For the RFI and associated screening risk assessments, soil, sediment, surface water, and groundwater samples were collected and analyzed for volatile organic compounds (VOCs) by test method 8260, semi-volatile organic compounds (SVOCs) by test method 8270C, polychlorinated biphenols (PCBs) by test method 8082, inorganics by test methods 6010B, and 7000A series. Specific samples were also analyzed for per cent moisture by test method SM-2540G, total organic carbon (TOC) by test method 9060, water hardness by test method 130.2/2340B, and organophosphorous by test method 8141A. Sediment samples in selected areas were analyzed for PCBs by the homologues test method 680 and per cent solids, while biota samples were analyzed for PCBs by the homologues test method 680 and per cent lipids. Specified monitoring wells were also analyzed for asbestos using EPA 600/4-83-043, Method 100.2. Soil samples were collected from the surface area (~0-2 ft.), from an intermediate subsurface area (~8-10 ft.), and from the soils just above the water table in the area. Owens Corning and Ohio EPA agreed that the following constituents would not be required to have laboratory analyses completed and/or be considered in the analyses of the risk assessments for soil: aluminum, calcium, iron, magnesium, manganese, potassium, sodium, vanadium, and zinc. This agreement was based on the facts that these constituents are human nutrients, occur naturally, and/or were not known to be prevalent in the wastes streams managed at the facility. An acceptable screening risk assessment benchmark of less than or equal to (\leq) $1E-5$ for excess lifetime cancer risks (ELCR) and a non-cancer hazard index (HI) benchmark of less than ($<$) 1.0 were used. These benchmark values are within criteria established by both U.S. and Ohio EPA. All site-wide, WMU/AOC, and biota analytical results were reviewed in comparison to the established background, regulatory, and/or risk associated criteria. The determinations concluded as a result of the sampling and analyses completed for the site-wide media, each WMU/AOC, and the selected biota are discussed separately in the following sub-sections.

4.7.1 Site-Wide Groundwater

Groundwater at the facility was evaluated on a facility-wide basis. Primarily, the uppermost saturated zone is considered groundwater. The data were tested for

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normality and an appropriate statistical analysis performed on the data. The exposure point concentrations (EPCs) used in the risk evaluations were the lower of the maximum detect and the calculated upper confidence limit (UCL).

Groundwater data for the RFI was collected from 24 monitoring wells (i.e., MW-1, MW-2A, MW-3, MW-5, W6C, MW-6A (dry), MW-7, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-23, MW-24, MW-25, MW-26, MW-27, MW-28, MW-29, MW-30). Site-wide groundwater flow was found to be from the southwest to the northeast towards Raccoon Creek. Wells MW-23 through MW-30 were installed for the purpose of this investigation. Well MW-23 (background well) was established to monitor groundwater coming onto the facility. Wells MW-24, MW-25, and MW-26 were placed along the northern property boundaries to monitor groundwater leaving the facility.

For the site-wide exposure to groundwater evaluation, all of the groundwater data were combined and the EPC was calculated to use as a point of comparison to the RCNs for a residential drinking water scenario. For the associated cancer risks, several constituents had EPCs exceeding the respective RCN, including the following: 1,2-dichloroethane; vinyl chloride; 1,4-dioxane; bis(2-ethylhexyl)phthalate; PCBs-Aroclor 1242 & 1260; and arsenic. These constituents were the drivers for the cancer risk, with arsenic being the primary contributor. Non-cancer risk drivers were found to be antimony, arsenic, thallium, and methanol, with antimony being the primary contributor.

The incremental ELCR was calculated to be $1E-3$ and the HI was calculated to be 170, which each exceed their respective benchmarks. Although both the cancer risk and non-cancer hazard goals were exceeded, from the standpoint of current groundwater exposure, groundwater is not used as a potable source and the facility is serviced by the Village of Granville municipal water supply.

A site-wide groundwater use restriction through completion of an environmental covenant will restrict the use of groundwater for drinking purposes to a depth of 40 feet. A land use restriction for specific areas (WMU 7, WMU 8, WMU 9) will also be completed through an environmental covenant. An Operations and Maintenance (O&M) Plan will be completed by Owens Corning and approved by Ohio EPA that will include long-term groundwater monitoring to assure that any constituents are not migrating beyond the monitored area(s).

4.7.2 Site-Wide Surface Water

4.7.2.a. Site-Wide Surface Water Human Health Screening Risk Assessments

The surface water data evaluated on a site-wide basis were grouped together into a separate, single site-wide surface water data set. The data distributions were tested

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and appropriate UCLs were calculated using USEPA (2004) ProUCL Version 3.0 software. Surface water data were also compared to the site-specific surface water background screening levels (BSLs). Naturally occurring metals detected only at concentrations at or below the BSL concentration were not included in the risk assessment calculations since they are not relevant to or indicative of a release.

Some organics were detected at very low concentrations in the surface water and were carried through in the risk assessment calculations. Of these detections, acetone and bis(2-ethylhexyl)phthalate are known as common laboratory contaminants. Arsenic and thallium were the only metals found to exceed their BSLs and were carried through in the risk assessment calculations.

The total ELCR for the surface water was calculated to be $1.26E-5$, which slightly exceeds the screening benchmark of $1E-5$. No single constituent exceeded the benchmark. The main contributor to the risk was bis(2-ethylhexyl)phthalate which is known as a common laboratory contaminant. When the ELCR is rounded to one significant figure, the benchmark would be met. The total HI was calculated to be 9, which exceeded the screening benchmark of 1.0. Thallium was found to be the only constituent with a HI greater than 1.0. The BSL established for thallium was 0.0096 mg/L with a maximum detection of 0.011 mg/L. The EPC for thallium was calculated to be 0.0098 mg/L with a maximum detection of 0.013 mg/L, each of which are only slightly greater than the BSL values. Thallium is a naturally occurring constituent. The indication of these elevated risk values are most likely due to background levels of thallium present in the surface water. A formal statistical comparison of the thallium concentrations in the site-wide surface water data, using the nonparametric Mann-Whitney Test, indicated no significant difference between the site-related median surface water concentrations and the background medians.

~~Based on these results and observations, the site-wide surface water does not appear to present significant cancer risks or non-cancer hazards above that attributable to background concentrations. No further action is warranted for human health risk assessment purposes regarding site-wide surface water.~~

4.7.2.b. Site-Wide Surface Water Ecological Screening Risk Assessments

The ecological risk assessment approach was completed using two steps: (1) screening ecological risk assessment (SERA), to determine which constituents, if any, needed additional data collection at the facility; and (2) baseline ecological risk assessment (BERA), where supplemental data were evaluated with respect to ecological receptors.

The SERA addressed areas of the site where ecologically relevant habitat was present and site activities could potentially have resulted in elevated concentrations of hazardous constituents. Based on the results of the SERA, surface water at the facility

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(streams, quarry ponds, wetlands) does not pose any significant ecological risks above that attributable to background concentrations and was not further evaluated in the BERA.

4.7.3 Site-Wide Sediment

4.7.3.a. Site-Wide Sediment Human Health Screening Risk Assessments

The site-wide sediment data were grouped together into a single data set. The site-wide data distributions were tested and the UCLs were derived based on US EPA (2004) recommendations. Sediment data were also compared to sediment BSLs. Those constituents with concentrations found to be below the BSLs were not included in the risk assessment calculations.

The total ELCR for site-wide sediment was calculated to be $2E-6$, which is below the established benchmark. The total HI for site-wide sediment was calculated to be 4, which exceeds the established benchmark. The primary contributor to the elevated HI was found to be iron, with some elevated contribution from manganese, both of which are naturally occurring. Ohio EPA and Owens Corning agreed that iron would be excluded from soil risk calculations because it is a human nutrient, occurs naturally, and/or was not known to be prevalent in the wastes streams managed at the facility. The facts for the basis of this agreement would also be considered relevant for this specific evaluation and iron should be excluded from calculations. The manganese EPC was calculated to be 740 mg/kg which is well below the BSL value of 1,400 mg/kg.

Based on these results and observations, the site-wide sediment does not appear to present significant cancer risk or non-cancer hazards above that attributable to background concentrations. No further action is warranted for human health risk assessment purposes in regards to site-wide sediment.

4.7.3.b. Site-Wide Sediment Ecological Screening Risk Assessments

The ecological risk assessment approach was completed using two steps: (1) screening ecological risk assessment (SERA), to determine which constituents, if any, needed additional data collection at the facility; and (2) baseline ecological risk assessment (BERA), where supplemental data were evaluated with respect to ecological receptors.

The SERA addressed areas of the site where ecologically relevant habitat was present and site activities could potentially have resulted in elevated concentrations of hazardous constituents. It has been determined that sediment found in the quarry ponds and the associated emergent wetland habitat do not pose a risk to ecological receptors. Potential ecological risks associated with stream sediment and any associated areas (flood plain, wetlands) were limited to two areas of stream habitat: (1)

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Lead was identified as a chemical of interest for benthic invertebrates in sediment at location WMU27-SD2. The assessment of lead related risks to benthic invertebrates was also protective of other ecological receptors at this location; and (2) PCBs were identified as chemicals of interest for wildlife in stream and flood plain habitat downstream of the on-site wastewater treatment plant. It was determined that PCB concentrations in this area do not pose a risk of direct toxicity to soil- and sediment-dwelling organisms.

Because lead was identified as a chemical of interest regarding benthic invertebrates and PCBs were identified as chemicals of interest regarding aquatic feeding wildlife, a BERA was completed. The following conclusions resulted from the BERA evaluation: (1) The single elevated lead concentration in sediment measured in 2002 was not confirmed in subsequent sampling of the area, and bioavailable lead concentrations measured in 2003 were not high enough to cause adverse effects. Any occurrence of elevated lead concentrations were not sufficiently widespread to affect benthic community structure and function; and (2) PCBs in sediment and biota tissue do not pose a risk to wildlife feeding from the unnamed tributary. The exposures estimated for birds and mammals were found to be well below levels that might cause adverse effects.

Based on the results and observations completed for the SERA and BERA, site-wide sediments from quarry ponds, emergent wetland habitat, flood plains, and/or stream sediments do not appear to present significant cancer risks or non-cancer hazards to the environment. No further action is warranted for ecological risk assessment purposes in regards to site-wide sediment.

***Please Note:** The WMUs and AOC which are identified in the RFI are described and listed in a series of tables that follow. The method of investigation, any environmental concerns revealed by the results of the investigation, the remedy proposed by Owens Corning to address the environmental concerns, and Ohio EPA's preferred remedy to address those concerns are provided for each WMU and AOC and are specific to human health risks. Site-wide ecological screening risks are discussed above and any WMU specific ecological screening risks will be discussed separately in the WMU description.*

4.7.4 WMU 1 – Current <90 Day Container Storage Area

The container storage area covers a contiguous area of about 15,400 square feet and is comprised of the four (4) areas formerly used for greater than ninety (90) day storage and an administrative office. The container storage area is now used to manage hazardous wastes for a period of less than ninety (90) days. No documented releases have occurred since clean closure of the area was certified by Ohio EPA in 1994. Based on visual inspection, there is no evidence that a release has occurred. The

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potential for a release to occur is very low because the unit has engineered controls in place (dedicated concrete sumps, concrete berms, covered building), wastes are stored on concrete, and the area is inspected regularly. These controls would prevent a release from reaching soils. It has been determined that WMU 1 is not a potentially significant source of contamination and that no further action is required for this unit.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) <90 day container storage area was certified clean closed by Ohio EPA in 1994. 2) No releases have been documented since the closure certification. 3) Visual inspection does not indicate a release has occurred. 4) Engineered controls in place. 5) Area is inspected regularly.	1) No current environmental concerns were identified for this unit during the investigation.	1) No further action.	1) No further action.

**4.7.5 WMU 2 – Suspected Burial Site Consisting of an Outdoor Area Located
 Between the Current <90-Day Container Storage Area and the Weathering
 Farm Landfill**

WMU 2 includes a suspected burial site consisting of an outdoor area located between WMU 1 and WMU 8. The suspected burial site reportedly began and ended operations in the 1960's. It is possible that the main storage building on the south part of WMU 1 was constructed over the burial site. This WMU includes the area known as "Miscellaneous Burial Site D." Documented evidence is not available to confirm whether this unit managed hazardous waste or if a release had occurred. Additionally, soil samples were collected in the area of the suspected burial site as part of the closure activities for WMU 1 and the sample results did not indicate the presence of contamination. Groundwater sampling in the area confirmed that groundwater was not impacted. Therefore, since no evidence of buried wastes could be found during the extensive investigations previously conducted in this area, it has been determined that

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WMU 2 is not a potentially significant source of contamination and that no further action is required for this unit.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) No documented evidence that a release occurred. 2) Soil samples from this area collected and analyzed during Ohio EPA certified closure for WMU 1 show no evidence of contamination. 3) Groundwater samples from this area collected and analyzed during Ohio EPA certified closure for WMU 1 show no evidence of contamination.	1) No current environmental concerns were identified for this unit during the investigation.	1) No further action.	1) No further action.

4.7.6 WMU 3 – Area Where Wastes were Reportedly Stored Along a Treeline Just North of the Current <90 Day Container Storage Area

Historic aerial photographs indicate that wastes appear to have been stored along a treeline just north of WMU1. This practice most likely occurred in the late 1960's and ceased in the late 1970's when the container storage area was constructed. It is suspected that PCB-contaminated oil may have been spread on the ground along this treeline. Soil samples were collected from WMU 3 during the closure activities completed for WMU 1 and the sample results confirmed the presence of PCBs. The area was further delineated with soil sampling and the PCB-impacted soil was removed in 1994. Groundwater sampling confirmed that groundwater was not impacted. Therefore, since the PCB-containing media was appropriately removed, it has been determined that WMU 3 is not a potentially significant source of contamination and that no further action is required for this unit.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) PCB-contaminated oils were stored and/or spread along the treeline just north of WMU 1.</p> <p>2) The area was adequately delineated during closure activities for WMU 1.</p> <p>3) Contaminated soils were removed in 1994.</p> <p>4) Groundwater sampling confirmed that groundwater had not been impacted from this unit.</p>	<p>1) No current environmental concerns were identified for this unit during the investigation.</p>	<p>1) No further action.</p>	<p>1) No further action.</p>

4.7.7 WMU 4 – Former Interim <90 Day Container Storage Area

The former interim less than ninety (90) Day Container Storage Area consists of an indoor area located within Building 63. This area was used as the <90 day hazardous waste storage area between 1988 and 1994 while WMU 1 was undergoing closure. Since shortly after Ohio EPA's approval of the WMU 1 closure certification in June 1994, this interim storage area has not been used for the storage of hazardous waste. There were no documented releases during the operational period and engineered controls (concrete floor) may have reduced the potential for a release. Based on current visual inspection, there is no evidence that a release occurred. However, the potential for past releases exists. Although WMU 4 is not a significant source of contamination, a limited investigation was completed to confirm or deny whether a release to soil has occurred.

Rinse samples from the concrete floor were collected and analyzed. VOCs carbon disulfide and methylene chloride were detected at levels below the reporting limits (estimated concentrations) in sample WMU4-RS1. These VOCs were not detected in the duplicate sample. SVOCs were not detected in this sample or the duplicate. The PCB Aroclor 1254 was detected at a concentration of 0.49J ug/L in sample WMU4-RS1

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and at 0.61J ug/L in the duplicate. These estimated concentrations are both below the laboratory reporting limit and no other PCBs were detected. The estimated concentrations are below the decontamination standard for water discharged to a treatment works or to navigable waters (3 ug/L [USEPA 1998]). Based on the uses of this area/Building 63 and the fact that PCBs were not found elsewhere at WMU 4, it has been determined that it is unlikely that this level of Aroclor 1254 poses a threat to human health or the environment.

One (1) surface soil and two (2) subsurface soil samples were collected from this unit. The maximum detected concentrations were used to characterize potential exposure. The detected organic constituents were carried further in the screening level risk assessment. The maximum metal concentrations were compared to the BSLs for soil. Only arsenic was found at a maximum concentration above the BSL and was included in the screening risk assessment calculation.

The ELCR for direct contact was calculated to be 5E-5, which exceeds the benchmark of 1E-5. The HI for direct contact was calculated to be 0.9, which is below the benchmark of 1.0.

The soil data were also analyzed using the generic RCNs for protection of groundwater. The ELCR was calculated to be 8E-4 and the HI to be 8, both above the specified benchmarks. Arsenic was the only constituent with an individual ELCR and HI greater than the benchmark.

The soils collected and analyzed contained both organic and inorganic constituents. None of the organic constituents detected in the soil exceeded the RCNs. The calculated risk and hazard levels were well below the established regulatory benchmark levels. Thus, from the perspective of organic constituents, it was determined that a release did not occur and a Phase II investigation was not warranted.

Metal constituents were detected in the soils. All but arsenic were found to be present at background concentrations and were not carried through the screening process. The maximum detected concentration of arsenic was 19.1 mg/kg, which is only slightly greater than the BSL of 19 mg/kg and is below the maximum detected concentration from background sampling of 20.1 mg/kg. A detailed statistical evaluation was performed for comparison of the WMU 4 arsenic data to the background data. The results of the statistical analysis (non-parametric Mann-Whitney Test) indicated that the median concentration of arsenic in soil at WMU4 exceeds the median background concentration. Based on these observations, the statistical test results likely are an artifact of the small size of the data set, as the WMU 4 arsenic concentrations do not appear to be significantly elevated above the naturally-occurring levels. A Phase II investigation is not warranted because a release has not occurred, as the available arsenic data indicate that the existing arsenic levels are very similar to the naturally-

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occurring background levels, there are no significant impacts to the environment, there were no documented releases, and the storage area was inside a building with engineered controls in place.

With implementation of the groundwater use restriction, it has been determined that WMU 4 is not a potentially significant source of contamination and that no further action is required for this unit.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Building 63 was used on an interim basis for <90 day storage of wastes while WMU 1 was undergoing closure. 2) Engineering controls in place. 3) Concrete floor rinse samples indicate presence of constituents, but at very low/estimated concentrations. 4) Soil samples collected outside of Building 63, with various constituents detected.	1) Direct contact ELCR over benchmark due to arsenic. 2) Protection of groundwater ELCR and HI over benchmarks due to arsenic. 3) Non-parametric Mann-Whitney Test indicates median concentration in soil exceeds median background concentration.	1) Arsenic is naturally occurring and is only slightly >BSL (19.1 mg/kg to 19.0 mg/kg BSL). 2) Arsenic value is less than the maximum detected concentration in the BSL data set (20.1 mg/kg). 3) Mann-Whitney test result likely an artifact of the small size of the data set. 4) As a conservative measure, a site-wide groundwater use restriction for drinking water to a depth of 40 feet will be completed.	1) Site-wide groundwater use restriction for drinking water to a depth of 40 feet.
5) Organics below RCNs. 6) Only arsenic greater than BSL, but less than maximum BSL value. 7) Arsenic is naturally occurring.			

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4.7.8 WMU 5 – Hazardous Waste Satellite Accumulation Areas

The Hazardous Waste Satellite Accumulation Areas are approximately three (3) feet by three (3) feet in size and exist at specific locations (laboratories, research/testing areas, etc.) throughout the facility. Operations in these areas began sometime in 1979 and continue to operate. These areas are used to manage small quantities of hazardous wastes. There have been no documented releases from the satellite accumulation areas. The potential for a release to occur in these areas is very low because these areas have engineered controls in place and, except for one area, the wastes are stored indoors or under cover. These areas are routinely viewed by operations personnel.

It has been determined that WMU 5 is not considered to be a significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Satellite accumulation areas used to manage small quantities of hazardous wastes. 2) Several areas throughout the facility, mostly indoors or under cover. 3) Operations personnel view areas frequently.	1) No current environmental concerns were identified for this unit.	1) No further action.	1) No further action.
4) Engineering controls in place. 5) No documented releases.			

4.7.9 WMU 6 – Non-Hazardous Waste Accumulation Areas (Area Outside of Building 61)

The Non-Hazardous Waste Accumulation Areas are located in laboratories and test production areas where wastes are generated and consist of a sealed drum with a top fill port. The areas are approximately three (3) feet by three (3) feet in size. Wastes accumulate in 5-gallon to 55-gallon containers by periodic addition of small quantities to containers. The wastes are picked up on a timed schedule. The operator and waste

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collection personnel regularly inspect each accumulation area. Site waste management records have historically been kept to document and quantify wastes at each location. Glycols, minerals spirits, used oils, phenol, formaldehyde, glycerins, dyes, and simulated lung fluids have been stored in these areas and they continue to be operational. There have been no documented releases from these areas. However, during a visual inspection of the areas some staining on concrete was observed outside of Building 61. Although WMU 6 was not considered to be a significant source of contamination, a limited soil investigation was completed at one location outside of Building 61.

One (1) soil boring was completed near Building 61 with three samples collected. Analytical results indicated the presence of VOCs at estimated concentrations found to be below the RCNs. A single SVOC was detected (bis(2-ethylhexyl)phthalate) at an estimated concentration which is less than the RCN. This SVOC constituent is also found to be a common laboratory contaminant. Various naturally occurring metals were detected, with arsenic being the only one found at concentrations greater than the BSL.

The direct contact ELCR was calculated to be $6E-5$ and the HI to be 1.01, both of which are greater than their respective benchmarks. Arsenic was the primary contributor to both of these elevated values, but no one constituent was found to exceed the HI benchmark.

The protection of groundwater ELCR was calculated to be $9E-4$ and the HI was calculated to be 9, both of which exceed their respective benchmarks. Again, arsenic was the driver for the elevated values.

The soils analyzed from this unit were found to contain organic and inorganic constituents. None of the organic constituents were found to be above their respective RCNs and the calculated risk and hazard levels were well below the associated benchmarks. Thus, regarding the organic constituents a release has not occurred. None of the metals were found to be above their BSL, except for arsenic. The maximum arsenic concentration was found to be 21.3 mg/kg, which is slightly outside the highest value of the arsenic BSL data set (20.1 mg/kg). A detailed statistical evaluation was performed for comparison of the WMU 6 data to the BSL data for arsenic. The results of the statistical analysis (non-parametric Mann-Whitney Test) indicated that the median arsenic concentration from WMU 6 is not significantly different from the median background concentration. A Phase II investigation is not warranted because a release has not occurred, as the available arsenic data indicate that the existing arsenic levels are very similar to the naturally occurring levels, and there are no significant impacts to the environment at this unit.

It has been determined that WMU 6 is not considered to be a significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Areas throughout the facility used to store non-hazardous wastes. 2) Staining on concrete viewed outside Building 61, soil samples collected and analyzed. 3) No releases documented. 4) VOCs and SVOCs detected, but at estimated concentrations and < RCNs. 5) Metals detected, but only arsenic found above BSL. 6) Arsenic naturally occurring. 7) Mann-Whitney Test indicates arsenic median concentration is not significantly different from background median concentration.	1) Direct contact ELCR and HI exceed benchmarks, due to arsenic. No individual constituent >HI benchmark. 2) Protection of groundwater ELCR and HI exceed benchmarks, due to arsenic.	1) Mann-Whitney Test indicates arsenic median concentration is not significantly different from background median concentration, no further action.	1) No further action.

4.7.10 WMU 7 – Wastewater Treatment and Sewerage System

The Wastewater Treatment and Sewerage System (WTSS) has been in use since start up of the facility in 1959. This unit is located on the southern portion of the site between Buildings 21 and 61. All sanitary and industrial wastes generated at the site feed into the wastewater treatment plant, which included hazardous wastes. Laboratory sinks are connected to the wastewater treatment system. Unknown types and quantities of potentially hazardous chemicals were reportedly poured down the laboratory sinks. The original WTSS consisted of a two-step process including extended aeration and a

polishing pond. The current WTSS includes four (4) ponds installed in 1995, an equalization pond, an aeration pond, a sedimentation pond, UV disinfection unit, and a polishing pond. An additional upgrade was completed in 1998, which involved installing a cover system for protection of ultraviolet light to control biological growth. Treated effluent discharges, pursuant to a National Pollutant Discharge Elimination System (NPDES) permit, into an unnamed tributary to Raccoon Creek. Other than a break in a transfer pipe which was repaired, there are no documented releases from this unit. Based on the age of the unit, the unlined ponds, and the fact that this unit has managed hazardous wastes, further action was needed to determine if a release to soil, sediment, or surface water had occurred within the boundary of WMU 7.

Soil

Fifteen (15) soil samples were collected from five (5) locations situated on each side of/between the four (4) ponds. Three (3) surface water samples and one (1) sediment sample were collected from the unnamed tributary bordering the unit. Five (5) different VOCs were detected in three (3) of the fifteen (15) soil samples collected. Of the five (5) detections, four (4) were qualified as having estimated concentrations below the reporting limits. SVOCs were detected in nine (9) of the fifteen (15) samples collected. All of the SVOC results were qualified as having estimated concentrations below the reporting limits. Various naturally occurring metals were found in the samples.

The direct contact ELCR for soil was calculated to be $7E-5$ and the soil direct contact HI was calculated to be 1.23, each which are greater than their respective benchmarks. Arsenic was the only constituent with an individual ELCR or HI greater than the established benchmarks.

The protection of groundwater ELCR for soil was calculated to be $1E-3$ and the associated HI was calculated to be 10, each which are greater than their respective benchmarks. Again, arsenic was the only constituent with an individual ELCR or HI greater than the benchmarks.

None of the organic constituents detected in soil were found at concentrations exceeding the RCNs. The calculated risk and hazard levels for organics were below the established benchmarks. Thus, from the perspective of the organic constituents, a release to soils has not occurred and a Phase II investigation was not warranted.

The maximum arsenic, beryllium, and cadmium concentrations in soil exceeds their respective BSL, however, the beryllium and cadmium concentrations were below their RCNs and no further evaluation was required for these constituents. Only arsenic was a significant contributor to the elevated ELCR and HI values for this unit. A formal statistical evaluation for comparison to background for arsenic was performed (unpaired T Test on the ln-transformed data). The results of the T Test indicated that the mean

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arsenic concentration at WMU 7 is not significantly different from the background mean. A Phase II investigation is not warranted because a release to soil has not occurred, as the available metals data indicate that the existing arsenic levels are very similar to the naturally occurring background levels, and there are no significant impacts to the soils at WMU 7.

Sediment

One (1) sediment sample was collected from the confluence point of the unnamed tributary bordering WMU 7. No VOCs were detected in this sample. Bis(2-ethylhexyl)phthalate was the only SVOC detected and was qualified as having an estimated concentration below the reporting limit. This SVOC is a common laboratory contaminant, and, at these estimated concentrations, would not be considered to be a result of waste management activities at the unit. PCB Aroclor 1242 was detected at a concentration of 27J ug/kg. Various naturally occurring metals were detected in the sediment sample. Cadmium, cobalt, copper, nickel, and selenium were all detected at concentrations greater than the BSL.

The incremental ELCR was calculated to be $2E-7$ and the HI was calculated to be 0.09, each of which are both below the respective benchmarks. A Phase II investigation is not warranted because a release to sediment has not occurred, and there are no significant impacts to the sediment at WMU 7.

Surface Water

Three (3) surface water samples were collected from the unnamed tributary bordering WMU 7. One (1) VOC (acetone) was detected in all of the samples collected. The acetone was qualified as having an estimated concentration below the reporting limit. Acetone is a common laboratory contaminant, and, at these estimated concentrations, would not be considered to be a result of waste management activities at the unit. No SVOCs or PCBs were detected in these surface water samples. Various naturally occurring metals were detected in the surface water at this unit. The concentrations of metals in the surface water were compared to the BSLs and only barium was found to be above the BSL.

The incremental ELCR for the surface water at WMU 7 could not be calculated because none of the constituents detected above the RCN and/or BSL were potentially carcinogenic compounds. The HI was calculated to be 0.2, which is well below the established benchmark. A Phase II investigation is not warranted because a release to surface water has not occurred, and there are no significant impacts to the surface water at WMU 7.

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A land use restriction for specific areas, including WMU 7, will be completed through an environmental covenant. A site-wide groundwater use restriction will also restrict the use of groundwater for drinking purposes to a depth of forty (40) feet. A long-term O&M Plan will be completed by Owens Corning and approved by Ohio EPA that will include periodic documentation of land use, general grounds maintenance of the specified area, and associated groundwater monitoring.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Soil, sediment, surface water investigated at unit. 2) Unit managed many wastes including hazardous wastes. 3) Former unit began operations in 1959, upgraded in 1995 and 1998. 4) Unlined ponds received wastes. 5) Only 1 release from a pipe break documented. 6) Treated effluent discharges to creek.	1) Soil direct contact ELCR and HI exceed benchmarks, due to arsenic, which is naturally occurring. 2) Soil protection of groundwater ELCR and HI exceeds benchmarks, due to arsenic. 3) Sediment ELCR and HI below benchmarks. 4) Surface water ELCR and HI below benchmarks.	1) Land use restriction through environmental covenant for the unit. 2) Site-wide groundwater use restriction for drinking water to a depth of 40 feet. 3) Long-term O&M Plan for general maintenance of area, documentation of land use, and groundwater monitoring.	1) Land use restriction through environmental covenant for the unit. 2) Site-wide groundwater use restriction for drinking water to a depth of 40 feet. 3) Long-term O&M Plan for general maintenance of area, documentation of land use, and groundwater monitoring.

4.7.11 WMU 8 – The Weathering Farm Landfill

The Weathering Farm Landfill was operated from 1958 until 1968. Trash, scrap insulation, sludges, liquids, solvents, resins, asbestos, adhesive wastes, and unknown types and quantities of waste materials were disposed in the landfill. The landfill received hazardous wastes when it was active. In 1983 and 1984, the Weathering Farm Landfill underwent an engineered closure based on a design with Ohio EPA concurrence. Closure activities involved regrading and final capping of the landfill. The engineered cap consists of twelve (12) inches of compacted clay, a drainage layer with twelve (12) inches of crushed stone, a geosynthetic filter fabric, and a final vegetative soil cover.

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Initially for the RFI, two (2) temporary wells were installed at the downgradient points of compliance (POCs) on the north side of the landfill. Two (2) soil samples were collected from each location at the 0-2 foot depth and 6-8 foot depth, which is at the top of the water table, during the temporary well installations. These soil samples were also used to confirm the borings were placed outside of the landfill limits. The data from all of these samples collected were not used in the unit/site-wide calculations, as the data were intended to only be used as indicators. MW-27 and MW-28 were permanently installed near the POC locations of the temporary monitoring wells at WMU 8. Several constituents, both organic and inorganic, were found to be above the generic RCNs. Many of these same constituents were also detected in monitoring wells located further downgradient but at lower/decreasing concentrations. All groundwater data from wells MW-27 and MW-28 were included with the site-wide groundwater data for the site-wide groundwater evaluation.

A site-wide groundwater use restriction through completion of an environmental covenant will restrict the use of groundwater for drinking purposes to a depth of forty (40) feet. A land use restriction for specific areas, including WMU 8, will also be completed through an environmental covenant. An O&M Plan will be completed by Owens Corning and approved by Ohio EPA that will include long-term groundwater monitoring, periodic documentation of land use, and general grounds maintenance for the specified areas.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Wastes, including hazardous wastes, were placed in landfill.</p> <p>2) Landfill was capped and cap included a geosynthetic filter fabric cover. OEPA concurred with cap design at the time.</p> <p>3) Constituents in groundwater above RCNs at POCs.</p> <p>4) Wells downgradient of POCs indicate decreasing concentrations of constituents.</p> <p>5) Wastes are buried within known footprint of landfill.</p>	<p>1) Buried wastes that include hazardous wastes.</p> <p>2) Constituents in groundwater above RCNs.</p> <p>3) Engineered clay cap with no bottom liner.</p>	<p>1) Land use restriction through environmental covenant for the unit.</p> <p>2) Site-wide groundwater use restriction for drinking water to a depth of 40 feet.</p> <p>3) Long-term O&M Plan for general maintenance of area and landfill cap, documentation of land use, and groundwater monitoring.</p>	<p>1) Land use restriction through environmental covenant for the unit.</p> <p>2) Site-wide groundwater use restriction for drinking water to a depth of 40 feet.</p> <p>3) Long-term O&M Plan for general maintenance of area and landfill cap, documentation of land use, and groundwater monitoring.</p>

4.7.12 WMU 9 – The Test Homes Landfill

The Test Homes Landfill was operated from 1968 to 1973. Trash, scrap insulation, sludges, liquids, solvents, resins, asbestos, adhesive wastes, and unknown types and quantities of waste materials were disposed in WMU 9. In 1983 and 1984, the landfill underwent an engineered closure based on a design with Ohio EPA concurrence. Closure activities involved re-grading and final capping of the landfill. The engineered cap consists of twelve (12) inches of compacted clay, a drainage layer with twelve (12) inches of crushed stone, a geosynthetic filter fabric, and a final vegetative soil cover. A spring was discovered to be running within the boundaries of WMU 9. An interceptor trench/piping system was placed upgradient of WMU 9 to capture this water and divert it around the landfill area and then discharges to a ditch. The water collected in this

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system was sampled at the discharge pipe and analyzed with the results indicating no significant impacts to the water and the discharge was below any established discharge limits.

Initially for the RFI, two (2) temporary wells were installed at the downgradient POCs on the north side of the landfill. Two (2) soil samples were collected from each location at the 0-2 foot depth and 6-8 foot depth, which is at the top of the water table, during the temporary well installations. These soil samples were also used to confirm the borings were placed outside of the landfill limits. The data from all of these samples collected were not used in the unit/site-wide calculations, as the data were intended to only be used as indicators. MW-29 and MW-30 were permanently installed near the POC locations of the temporary monitoring wells at WMU 9. Only naturally occurring inorganic constituents were found to be above the generic RCNs. All groundwater data from wells MW-29 and MW-30 were included with the site-wide groundwater data for the site-wide groundwater evaluation.

A site-wide groundwater use restriction through completion of an environmental covenant will restrict the use of groundwater for drinking purposes to a depth of forty (40) feet. A land use restriction for specific areas, including WMU 9, will also be completed through an environmental covenant. An O&M Plan will be completed by Owens Corning and approved by Ohio EPA that will include long-term groundwater monitoring and documentation of land use for the specified areas.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Wastes, including hazardous wastes, were placed in landfill.</p> <p>2) Landfill was capped and cap included a geosynthetic filter fabric cover. OEPA concurred with cap design at the time.</p> <p>3) Interceptor trench/piping system captures water that would migrate through landfill, diverts water, and discharges to ditch around landfill.</p> <p>4) Only naturally occurring inorganics found above RCNs.</p> <p>5) Wastes are buried within known footprint of landfill.</p> <p>6) Cap erosion on northeast side of landfill.</p>	<p>1) Buried wastes include hazardous wastes.</p> <p>2) Engineered clay cap with no bottom liner.</p> <p>3) Cap erosion on northeast side of landfill.</p> <p>4) Assurance that diversion trench is operating properly.</p>	<p>1) Land use restriction through environmental covenant for the unit.</p> <p>2) Site-wide groundwater use restriction for drinking water to a depth of 40 feet.</p> <p>3) Cap erosion fix completed.</p> <p>4) Long-term O&M Plan for general maintenance of area and landfill cap, documentation of land use, groundwater monitoring, and diverter trench piping system inspections/maintenance.</p>	<p>1) Land use restriction through environmental covenant for the unit.</p> <p>2) Site-wide groundwater use restriction for drinking water to a depth of 40 feet.</p> <p>3) Long-term O&M Plan for general maintenance of area and landfill cap, documentation of land use, groundwater monitoring, and diverter trench piping system inspections/maintenance</p>

4.7.13 WMU 10 – Suspected Burial Site Near the Southeast Corner of the Test Homes Landfill

The suspected burial site near the southeast corner of the Test Homes Landfill consists of an outdoor area of unknown size and shape where a small quantity of organophosphates was reportedly buried. The burial reportedly occurred during a single incident in the 1960s. WMU 10 includes the area known as "Miscellaneous Burial Site B." Hazardous wastes were not known to be placed in this unit. It is known that

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organophosphates break down relatively quickly in the environment. *Verschueren (1983)* presents many organophosphates that have a 75% to 100% disappearance from soils within one (1) to twelve (12) weeks.

Although WMU 10 is not believed to be a potentially significant source of contamination, evaluations regarding the unit will be completed upon review of analytical results obtained from groundwater samples at WMU 9 and water sample results from the interceptor trench diverting upgradient water around WMU 9. Upon review of the WMU 9 and interceptor trench data, it was determined that no organophosphate concentrations were found to be above their respective reporting limits at any of the associated sampling locations.

It has been determined that WMU 10 is not considered to be a significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Reportedly 1-time burial of organophosphates in the 1960s. 2) Many organophosphates disappear in soils quickly. 3) Spring water runs directly beneath WMU 9 landfill so interceptor trench piping system installed to divert water around Test Homes Landfill. 4) Final evaluation of area based on results from WMU 9 and interceptor trench water sampling.	1) Organophosphates found to be below detection limits in groundwater from interceptor system. 2) No indications of contamination from this unit in WMU 9 sampling.	1) No further action.	1) No further action.

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4.7.14 WMU 11 – Suspected Burial Site Near the Electrical Substation ((a.k.a.) Miscellaneous Burial Site C)

The suspected burial site near the electrical substation consists of an outdoor area that reportedly had approximately thirty (30) drums of wastes of unknown contents buried in it during the 1960s. The area is located east of the Weathering Farm Landfill. Ground penetrating radar did not confirm the presence of buried objects or disturbed material. Additionally, a radiological survey in this area, which included excavation of test pits, did not identify buried drums. Although there is no physical evidence that this unit exists, limited soil sampling was completed to confirm if a release to soil had occurred.

Two (2) soil sampling locations were completed north and downgradient of the electrical substation, with three (3) soil samples collected from each boring. Of the VOCs and SVOCs detected, all were qualified as having estimated concentrations that were below the reporting limits. Of the inorganics detected, arsenic, beryllium, and thallium were found to be above the BSLs.

The direct contact ELCR was calculated to be $7E-5$ and the HI was calculated to be 2, each of which is greater than their benchmark. Arsenic was the only constituent with an individual benchmark greater than the ELCR and/or HI.

The protection of groundwater ELCR was calculated to be $1E-3$ and the HI was calculated to be 10, each of which are greater than their benchmark. Arsenic was the only constituent with an individual ELCR greater than $1E-5$ and arsenic and thallium were the only constituents with individual HI greater than 1.0.

Both organic and inorganic constituents were found in soil at WMU 11. None of the organic constituents were found at concentrations exceeding their RCN. The calculated ELCRs and HIs were below the regulatory benchmarks. Therefore, from the perspective of the organic constituents, a release has not occurred and a Phase II investigation is not warranted.

Arsenic, beryllium, and thallium were found to exceed their BSLs. Beryllium was then found to be below the RCN and was dropped from further consideration. Arsenic was the only significant contributor to the elevated ELCRs and arsenic and thallium were the only significant contributors to the elevated HIs. Formal statistical analyses were performed for comparison of the arsenic and thallium data to background. The results of the statistical analysis for arsenic (unpaired T Test with Welch Correction) indicated that the mean arsenic concentration in WMU 11 soil is not significantly different from the background mean. The results of the statistical analysis for thallium (unpaired T Test) indicated that the mean thallium concentration in WMU 11 soil is not significantly different from the detected background mean. A Phase II investigation is not warranted for these inorganics because a release to soil has not occurred, as the available metals

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data indicate that the existing arsenic and thallium levels are very similar to the naturally occurring background levels, and there are no significant impacts to the environment.

It has been determined that WMU 11 is not considered to be a significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Reportedly burial of ~30 drums of unknown contents in the 1960s. 2) Ground penetrating radar did not show presence of drums. 3) Trench pits did not provide evidence of buried drums. 4) Organics and inorganics detected in soil samples. 5) No organics > RCN, beryllium < BSL, arsenic and thallium > BSL. 6) Statistical analyses indicate arsenic and thallium mean are not significantly different than background means. 7) Arsenic and thallium are naturally occurring.	1) Direct contact ELCR and HI > benchmarks, due to arsenic. 2) Protection of groundwater ELCR > benchmark, due to arsenic. HI > benchmark, due to arsenic and thallium. 3) Statistical analyses indicate arsenic and thallium means are not significantly different than background means.	1) Unpaired T Test with Welch Correction indicates that mean arsenic concentration is not significantly different than background mean concentration. 2) Unpaired T Test indicates that the mean thallium concentration is not significantly different than the background mean concentration. 3) No further action.	1) No further action.

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4.7.15 WMU 12 – Former South Quarry Area

The Former South Quarry Area refers to the area near the northern end of the property that was used by a former owner and is approximately 1,200 feet south of State Route 37. Owens Corning used this area for the disposal of a variety of waste materials, including reactive and flammable chemicals/hazardous wastes. WMU 12 is separated by the quarry road into two (2) parcels. One (1) parcel is generally believed to be located between the current hard-fill area and the two (2) small southernmost ponds on the west side of the quarry road (Pond C and Pond D). The other parcel is located on the east side of the quarry road in the same general area. Disposal operations began in 1958 and ended in 1975. Peroxides, volatile liquids and flammable solvents were reported to be burned, exploded, poured, or dispersed on the ground. Dangerously unstable wastes were reportedly shot with firearms. Surface spreading and explosive decomposition reportedly occurred along the south rim of the former quarry area, approximately 30 to 50 feet above the quarry water level. A variety of flammable wastes (hydrocarbons and solvents) were reportedly burned in pits in an area between the middle and southern quarry ponds on the east side of the quarry road. A shallow earthen pit was reportedly used for fire training purposes about three times per year and a separate but adjacent small concrete pit was reportedly used to conduct burn testing of pipe insulation. Both pits appear to have been backfilled with soil. The area of WMU 12 that is west of the quarry road is currently being used to store construction debris. The potential for a release to soil to have occurred is likely and further investigations were completed to determine if a release to soil, sediment, or surface water had occurred.

For the investigation, a sampling grid was placed over WMU 12 with 100 ft. by 100 ft. grid spacing. Deviations from these dimensions occurred to account for field conditions. Grid sizes were adjusted in the proximity of Ponds C and D and sampling locations were slightly moved to avoid drilling through large pieces of concrete. In general, the soil samples were collected from the center of the grids for the purpose to confirm or deny whether a release had occurred. In all, eight (8) deep borings and nineteen (19) shallow borings were completed with a total of thirty-eight (38) soil samples collected for analyses. A sediment and surface water sample was collected from the wet area, north of and adjacent to, the eastern portion of WMU 12.

Soil

Several VOCs and SVOCs were detected in the soils. Of these detections, every result except one (1) (fluoranthene at 0.61 mg/kg) was qualified as having estimated concentrations that were below reporting limits. Some of these detected constituents are known to be laboratory contaminants. Many inorganics were detected, but when

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compared to the BSLs, only arsenic, barium, chromium, and lead were found to be greater than their BSLs. To be conservative, chromium VI associated values were used for this WMU's calculations.

The direct contact ELCR was calculated to be $8E-5$ and the HI was calculated to be 2, each of which exceeds their benchmark. Only arsenic had an individual ELCR and/or HI greater than the benchmark.

The protection of groundwater ELCR was calculated to be $1E-3$ and the HI was calculated to be 10, each of which exceeds their benchmark. Only arsenic had an individual ELCR greater than the benchmark and arsenic and chromium were the primary contributors to the elevated HI.

Both organic and inorganic constituents were detected in soil. None of the organic constituents detected in soil were found at concentrations exceeding the screening criteria. The calculated ELCRs and HIs for organics were below the regulatory benchmarks. Therefore, from the perspective of organic constituents, a release to soil has not occurred and a Phase II is not warranted. Four (4) inorganics (arsenic, barium, chromium, lead) were detected above the soil BSLs. Barium and lead concentrations were found to be below their RCN and were not evaluated further. Arsenic was the only metal contributing significantly to the ELCR value and arsenic and chromium were the only metals contributing significantly to the HI value. Formal statistical comparisons to background were performed for the arsenic and chromium in the WMU 12 soil. The results of the statistical analysis for arsenic (unpaired T Test with Welch Correction) indicated that the mean arsenic concentration is not significantly different from the background mean. The results of the statistical analysis for chromium (nonparametric Mann-Whitney Test) indicated that the median chromium concentration is significantly less than the background median. As the soil data set for WMU 12 is larger than those for any other WMUs and there is a significant amount of data available (38 samples), USEPA (2004) ProUCL software was used to derive more appropriate EPCs for the arsenic and chromium data based on the UCL concentrations. These calculated EPCs (16 mg/kg for arsenic and 9.9 mg/kg for chromium) are both below the site-specific BSLs (19 mg/kg for arsenic and 22 mg/kg for chromium) which reinforces that these metals are naturally occurring and a release to soil has not occurred.

Sediment

Four (4) VOCs and no SVOCs were detected in the sediment sample. Of the VOCs detected, no concentrations were found to be above the RCNs. Several metals were detected, but only barium, mercury, and selenium concentrations were found to be above the BSLs in the sediment.

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The incremental ELCR was calculated to be $1E-9$ and the HI was calculated to be 0.08, each of which is below their benchmark. Therefore, a release to sediment has not occurred and a Phase II investigation is not warranted.

Surface Water

In the surface water sample collected at WMU 12, toluene was the only VOC detected. This detection was qualified as having an estimated concentration which is below the reporting limit. No SVOCs were detected. Of the metals detected, arsenic, barium, and thallium concentrations were found to be above the BSLs.

The incremental ELCR was calculated to be $4E-4$ and the HI was calculated to be 10, each of which is greater than their benchmark. Arsenic was the only constituent with an individual ELCR greater than the benchmark and arsenic and thallium were the main contributors to the elevated HI.

Arsenic, barium, and thallium were detected at concentrations above the BSL in surface water. The RCN for barium was not exceeded and barium was not evaluated further. Arsenic in surface water was associated with the elevated ELCR and HI values, and thallium in surface water was associated with an elevated HI value based on use of the surface water as residential drinking water. This exposure scenario is very conservative as no one would be expected to be drinking or showering with this water. No formal statistical comparison of WMU 12 surface water data to background was performed for these constituents due to insufficient data (only one sample from the WMU). A formal statistical comparison of the arsenic and thallium concentrations in the site-wide surface water data (including results from WMUs 7, 12, 21, 30), using the nonparametric Mann-Whitney Test, indicated no significant difference between the site-related median surface water concentrations and the background medians. Based on these results and observations, a release to surface water has not occurred and a Phase II investigation is not warranted.

It has been determined that WMU 12 is not considered to be a significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Soil, sediment, and surface water investigated.</p> <p>2) Large data set for soil, but only one sample each for surface water and sediment.</p> <p>3) Very large area where various wastes and hazardous wastes were disposed by burning, pouring, and/or exploding within the unit.</p> <p>4) Unit in operation from 1958 to 1975.</p> <p>5) Sediment ELCR and HI < benchmarks.</p> <p>6) Surface water evaluation for residential drinking water scenario.</p> <p>7) Surface water data compared to site-wide data.</p> <p>8) Arsenic and chromium are naturally occurring.</p> <p>9) Chromium VI defaults used as a conservative measure.</p>	<p>1) Soil ELCR and HI for direct contact > benchmarks, due to arsenic.</p> <p>2) Soil ELCR and HI for protection of groundwater > benchmarks, due to arsenic and chromium.</p> <p>3) Surface water incremental ELCR > benchmark, due to arsenic; and direct contact HI > benchmark, due to arsenic and thallium.</p> <p>4) Surface water default as residential drinking water scenario is very conservative.</p> <p>5) No unit specific formal statistical analyses for unit surface water, but site-wide medians compared to background medians.</p>	<p>1) Unpaired T Test with Welch Correction for arsenic in soil indicates arsenic mean concentration is not significantly different from background mean.</p> <p>2) Non-parametric Mann-Whitney Test for chromium in soil indicates median chromium concentration is significantly less than the median background concentration.</p> <p>3) Non-parametric Mann-Whitney Test for site-wide surface water data to background data for arsenic and thallium indicates no significant difference in median concentrations.</p> <p>4) No further action.</p>	<p>1) No further action.</p>

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4.7.16 WMU 13 – Mt. St. Helen's Ash Disposed of in the Southwestern Quarry Ponds

In the early 1980s, drums of volcanic ash from the 1980 eruption of Mt. St. Helen's were disposed of in the southwestern quarry ponds (Pond D). The ash had been stored at the facility for use in a test product. In August 2002, the pond was drained and the drums of ash removed. The drums remained relatively intact and the ash waste was sampled and analyzed prior to off-site disposal. The ash waste in the drums was found not to be a hazardous waste and was found to be similar to native soils. The pond was allowed to refill and habitat common to the area and pond has re-established.

It has been determined that WMU 13 is not a potentially significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Mt. St. Helen's ash used in test product. 2) Drums of ash disposed in Pond D in 1980s. 3) Pond D to be drained and drums of ash and/or ash to be removed. 4) Drums placed in northeast end of pond.	1) Is ash hazardous waste or adversely affecting Pond D? 2) Are drums intact or has there been a release? 3) Draining of pond and effect on aquatic life?	1) Pond D drained and drums of ash removed. 2) Drums found to be relatively intact and no indication of a release. 2) Analytical results indicate waste ash was not hazardous and was similar to native soils. 3) Drums of waste ash appropriately disposed off-site. 4) Pond not totally drained as ash was in the northeast end of pond, allowed to quickly refill. 5) Habitat common to the area and pond has re-established. 6) No further action.	1) No further action.

4.7.17 WMU 14 – Small Concrete Tank Testing Pit

WMU 14 was a small concrete tank testing pit located north of Pond D and west of the quarry road. Reportedly, gasoline was burned in this pit on one (1) occasion to test the flame resistance of fiberglass pipe insulation. The pit was filled with soil. Hazardous wastes were not managed in this unit and no documented releases occurred. The potential for a release was low when the unit was active due to the flammable nature of the gasoline used for the fire test and the fact that the test pieces were burned on a concrete pad.

Initially, a single soil boring was completed with two (2) soil samples collected at the 0-2 ft. depth and 2-4 ft. depth at the top of the water table. Based on the analytical results from these samples, it was determined additional samples should be collected from the area to determine if a release to the soil had occurred. Four (4) additional soil sampling locations, off-setting the initial location by ten (10) feet in all directions, were selected and samples collected from the 0-2 ft. depth and from the top of the water table at ~4 ft. depth and sent for analyses.

VOCs and SVOCs were detected in the soil samples. Many of the detections were qualified as having estimated concentrations that were below their reporting limits and/or are known as common laboratory contaminants. PCBs were detected in some of the soil samples. No metals were found to be above the BSLs, so no metals would be included in further evaluations.

The direct contact ELCR was calculated to be $2E-6$ and the HI was calculated to be 0.09, each of which is below the established benchmarks.

The protection of groundwater was calculated to be $2E-5$ and the HI was calculated to be 10, each of which is greater than the established benchmarks. Aroclor 1248 was the only constituent with an individual ELCR greater than $1E-5$ and naphthalene was the only constituent with an individual HI greater than 1.0.

Two (2) organic constituents were mainly responsible for the risk screening values exceeding the benchmarks (naphthalene = $HI > 1.0$; PCB Aroclor 1248 = $ELCR > 1E-5$). For each of these constituents, the elevated screening results were only relevant to the protection of groundwater pathway, as the results of the direct contact pathway were all below the established benchmarks. On a site-wide basis, among the 128 WMU-related soil samples collected and analyzed, naphthalene was detected only three (3) times and only once was above the RCN for protection of groundwater, while Aroclor 1248 was detected only twice with each detection exceeding the RCN for protection of groundwater. Thus, each of these constituents have a site-wide frequency detection of less than five (5) percent, which in accordance with established protocol (*Ohio EPA CPRG (2006)*), precludes the need for further action. Based on the low frequency of

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detection, the potential impact to groundwater is unlikely since the groundwater is not used as a drinking water source at the facility and the shallow saturated zone of unconsolidated soils would not be expected to yield the quantity of water necessary for potable use. Based on the results of this evaluation and observations, a release to soil has not occurred, there have been no significant impacts to the environment from this one-time test burn, and a Phase II investigation is not warranted.

A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet will be completed through implementation of an environmental covenant. With implementation of the groundwater use restriction, it has been determined that WMU 14 is not a potentially significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) One-time use of concrete pit to test burning of fiberglass pipe insulation. 2) Gasoline used as accelerant/fuel. 3) Pit filled with soil after use. 4) Water table at 4-6 ft. 5) No metals > BSLs. 6) Groundwater not used as drinking water at facility.	1) Protection of groundwater ELCR > benchmark, due to PCB Aroclor 1248. 2) Protection of groundwater HI > benchmark, due to naphthalene. 3) Detection frequency for PCB Aroclor 1248 and naphthalene is < 5% which CPRG indicates is minimum % value for remedial action.	1) No further action based on detection frequency guidance. 2) As a conservative measure, a site-wide groundwater use restriction for drinking water to a depth of 40 ft. will be completed.	1) Site-wide groundwater use restriction for drinking water to a depth of 40 ft.

4.7.18 WMU 15 – Small Former Quarry Excavation About 150 Feet Northeast of Current Paper Incinerator

WMU 15 was a small former quarry area used for disposal of wastes and possibly small tanks or cylinders. The unit is located immediately east of the quarry road and west of Pond H. Only one (1) aerial photograph (1979) indicates any activity in this area other than some minor quarry operations. Hazardous wastes were managed at this unit. There were no documented releases, but the potential for a release to have occurred

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was likely. Further investigation was conducted to determine if a release to soil had occurred.

Four (4) soil sampling locations were completed surrounding the quarry excavation area to confirm/deny whether a release had occurred at this unit. Two (2) samples were collected from each boring, one (1) from 0-2 feet and the other from just above the water table at ~6-8 feet, except one (1) location where only a single sample was collected due to the shallow water table. No VOCs were detected in any of the samples. Six (6) different SVOCs were detected, but all were qualified as having estimated concentrations that were below the reporting limits. Various metals were detected, but only arsenic and thallium were found to exceed the BSLs and were further evaluated.

The direct contact ELCR was calculated to be $1E-4$ and the HI was calculated to be 3, each of which exceeds the established benchmarks. Arsenic was the only constituent with an individual ELCR and HI greater than the benchmarks.

The protection of groundwater ELCR was calculated to be $2E-3$ and the HI was calculated to be 20, each of which exceeds the established benchmarks. Arsenic was the only constituent with an individual ELCR greater than $1E-5$ and arsenic and thallium were the only constituents with individual HIs greater than 1.0.

None of the organic constituents detected in soil were found at concentrations exceeding the RCNs. The calculated risk and hazard levels were less than the benchmarks. Therefore, from the perspective of organic constituents, a release has not occurred and a Phase II is not warranted. Two (2) metals (arsenic and thallium) were found at concentrations exceeding the BSLs. Formal statistical analyses were completed to compare the data sets for arsenic and thallium to the background data sets. The results of the statistical analysis for thallium (unpaired T Test) indicated no significant difference between the mean thallium concentrations in WMU 15 soil and the background soil. The results of the statistical analysis for arsenic (nonparametric Mann-Whitney Test) indicated that the median arsenic concentration for WMU 15 soil is higher than the median background arsenic concentration. Of the seven (7) soil samples collected and analyzed, only two (2) samples had arsenic concentrations (20.3 mg/kg and 51.4 mg/kg) exceeding the BSL of 19 mg/kg. The potential impact to groundwater is particularly unlikely since groundwater is not used as a source for drinking water at the facility and the arsenic is most likely all naturally occurring. The shallow saturated zone of unconsolidated soils would not be expected to yield the quantity of water necessary for potable use. A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet will be completed through implementation of an environmental covenant. Based on these results and observations, a Phase II is not warranted because a release to soil has not occurred, the available metals data indicate that the existing arsenic and thallium levels are similar to the naturally occurring

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background levels, and there have been no significant impacts to the environment at WMU 15.

With implementation of the groundwater use restriction, it has been determined that WMU 15 is not a potentially significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Hazardous wastes managed at the unit. 2) No documented releases. 3) No VOCs detected and SVOCs all at estimated concentrations. 4) Of metals detected, only arsenic and thallium > BSLs. 5) Formal statistical analysis for arsenic and thallium compared to background. 6) Groundwater not used as a source for drinking water at facility.	1) Direct contact ELCR and HI > benchmarks, due to arsenic. 2) Protection of groundwater ELCR > benchmark, due to arsenic; and HI > benchmark, due to arsenic and thallium. 3) Formal statistical evaluation found thallium mean indicated no significant difference to background. 4) Formal statistical evaluation found arsenic median concentration to be higher than median background concentrations. 5) Arsenic values observed to be similar to arsenic background values.	1) Unpaired T Test found thallium mean indicated no significant difference to background, no further action. 2) Non-parametric Mann-Whitney Test found arsenic median concentration to be higher than median background concentrations. 3) Arsenic values observed to be similar to arsenic background values. 4) Site-wide groundwater use restriction for drinking water to a depth of 40 ft.	1) Site-wide groundwater use restriction for drinking water to a depth of 40 ft.

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4.7.19 WMU 16 – Old Incinerator which was Located Between the Center and Southern Quarry Ponds on the East Side of the Quarry Road

WMU 16 consisted of a brick structure with a grill-like top that was used for the burning of proprietary document paper waste. This unit did not manage hazardous waste. The unit was located near the western end of the southern quarry pond on the east side of the quarry road. The unit was reportedly used from the early 1960s until 1988 when the existing incinerator unit began operation. There are no documented releases from this unit. It was determined that shallow soil should be further evaluated to determine if a release had occurred.

Five (5) soil sampling locations were selected and samples were collected from the 0-2 foot interval and sent for analyses. No VOCs or SVOCs were detected in the soils. Various metals were detected, but only arsenic, cadmium, and thallium were found to be greater than the BSLs and they would be further evaluated.

Cadmium was found to be less than the RCN and would not be further evaluated. The direct contact ELCR was calculated to be $9E-5$ and the HI was calculated to be 2, each of which exceeds the established benchmarks. Arsenic was the only constituent with an individual ELCR greater than the benchmark and arsenic was found to be the primary contributor to the elevated HI.

The protection of groundwater ELCR was calculated to be $1E-3$ and the HI was calculated to be 20, each of which exceeds the established benchmarks. Arsenic was the only constituent with a significant contribution to the elevated ELCR and HI. The HI for thallium (1.07) only slightly exceeded the regulatory benchmark of 1.0.

The soil samples collected at WMU 16 contained only arsenic and thallium at concentrations greater than the RCNs. No VOCs or SVOCs were detected. A formal statistical comparison to background (unpaired T Test) was performed for arsenic. These results indicated that the mean arsenic concentration in WMU 16 soil is not significantly different from the mean background concentration. The reported maximum thallium concentration (1.9 mg/kg) only slightly exceeded the BSL (1.8 mg/kg) but was less than the maximum detected background concentration of 2.5 mg/kg. A Phase II investigation is not warranted because a release to soil has not occurred, as the available metals data indicate that the existing arsenic and thallium levels are similar to the naturally occurring background levels, and there are no significant impacts to the environment at WMU 16.

It has been determined that WMU 16 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Paper documents burned in unit from 1960s to 1988. 2) Surface soil samples collected and analyzed. 3) No VOCs or SVOCs detected. 4) Arsenic, cadmium, thallium > BSL, but cadmium < RCN so not further evaluated. 5) Formal statistical evaluation for comparison of arsenic data to background data. 6) Thallium only slightly > BSL (1.9 mg/kg to 1.8 mg/kg). 7) Groundwater not used as a source for drinking water at the facility. 8) Arsenic and thallium are naturally occurring.	1) Direct contact ELCR and HI > benchmarks, due to arsenic. 2) Protection of groundwater ELCR > benchmark, due to arsenic; HI > benchmark, due to arsenic and thallium. 3) Arsenic mean concentration found to not be significantly different from background mean concentration. 4) Thallium only slightly > BSL, but maximum unit concentration < maximum background concentration (1.9 mg/kg to 2.5 mg/kg).	1) Unpaired T Test indicated that the arsenic mean concentration was not significantly different from background mean concentration, no further action. 2) Thallium only slightly > BSL, but maximum unit concentration < maximum background concentration (1.9 mg/kg to 2.5 mg/kg), no further action.	1) No further action.

4.7.20 WMU 17 – USTs at Building 11

These USTs were used to store heating and fuel oil and did not manage hazardous waste. The USTs were removed during the period April through December 1988. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed. Reportedly, there was no evidence of a release when the tanks were removed.

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As these USTs have been appropriately removed with all activities documented, it has been determined that WMU 17 is not a potentially significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) USTs used to store heating and fuel oil. 2) USTs removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) USTs did not manage hazardous wastes.	1) Releases known to have occurred at some USTs, but no evidence of release during tank removal activities. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) USTs removed and appropriately closed, no further action.	1) No further action.

4.7.21 WMU 18 – USTs at Building 22

These USTs were used to store fuel oil and did not manage hazardous waste. The USTs were removed during the period April through December 1988. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed.

As these USTs have been appropriately removed with all activities documented, it has been determined that WMU 18 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) USTs used to store fuel oil. 2) USTs removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) USTs did not manage hazardous wastes.	1) Releases known to have occurred at some USTs, but no evidence of a release during tank removal activities. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) UST removed and appropriately closed, no further action.	1) No further action.

4.7.22 WMU 19 – UST at Building 53

This UST was used to store fuel oil and did not manage hazardous waste. The UST was removed during the period April through December 1988. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed.

As this UST has been appropriately removed with all activities documented, it has been determined that WMU 19 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) UST used to store fuel oil. 2) UST removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) UST did not manage hazardous wastes.	1) Releases known to have occurred at some UST, but no evidence of a release during tank removal activities. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) UST removed and appropriately closed, no further action.	1) No further action.

4.7.23 WMU 20 – USTs at Building 60

These three (3) USTs contained leaded and/or unleaded gasoline. During tank removals, elevated levels of toluene, ethyl benzene, and xylene were found in the soil near the three (3) gasoline USTs located near Building 60. Approximately 264 tons of gasoline-contaminated soils were removed in 1990 from the area around the three (3) USTs. In December 1993, the Ohio Bureau of Underground Storage Tank Regulations (BUSTR) issued a No Further Action (NFA) letter for the release incident for the USTs located at Building 60 (incident # 459049) indicating that the remedial and investigation activities fulfilled BUSTR requirements.

Based on the fact that the NFA letter was issued by BUSTR, it has been determined that WMU 20 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Three USTs used to store leaded and unleaded gasoline. 2) USTs removed in 1988 and elevated concentrations of toluene, ethyl benzene, and xylene in soils. 3) Release incident # 459049 to BUSTR.	1) Documented release. 2) 264 tons of contaminated soils removed. 3) NFA issued by BUSTR in 1993.	1) USTs removed and appropriately closed, no further action.	1) No further action.

4.7.24 WMU 21 – UST at Building 61

This UST was used to store fuel oil and did not manage hazardous waste. The UST was removed during the period April through December 1988. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed.

As this UST has been appropriately removed with all activities documented, it has been determined that WMU 21 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) UST used to store fuel oil. 2) UST removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) UST did not manage hazardous wastes.	1) Releases known to have occurred at some USTs, but no evidence of a release during tank removal activities. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) USTs removed and appropriately closed, no further action.	1) No further action.

4.7.25 WMU 22 – UST at Building 71

WMU 22 consisted of a steel UST located north of Building 71, between the building and the parking lot. The 10,000 gallon tank was placed into service in 1960 and was used for #2 fuel oil storage for heating purposes. It was removed April 26, 1988. During closure activities, all supply, return, and vent lines were disconnected, drained, and capped. Fuel was removed and the UST was properly removed, cleaned, and disposed. Soils removed during closure were stockpiled in a parking lot awaiting soil analytical results. The highest TPH result was 20 mg/kg. Soils were then returned to the excavation pit. This tank did not manage hazardous waste. During tank removal, an odor was present in the excavation pit. Due to the presence of this odor, a limited investigation was completed to determine if a release to soil had occurred.

Two (2) soil sampling locations were completed at each end of the former tank pit north of Building 71 to confirm/deny whether a release had occurred at this unit. Three (3) samples were collected from each soil boring. Several VOCs and SVOCs were detected, with many of them being qualified as having estimated concentrations that were below the reporting limits. Of the metals detected, only arsenic and chromium were found to exceed the BSLs and would be further evaluated.

The direct contact ELCR was calculated to be 9E-5 and the HI was calculated to be 2, each of which exceeds the established benchmarks. Arsenic was the primary contributor to the elevated ELCR and HI.

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The protection of groundwater ELCR was calculated to be $1E-3$ and the HI was calculated to be 20, each of which exceed the established benchmarks. Arsenic was the primary contributor to the elevated ELCR and arsenic and chromium were the primary contributors to the elevated HI.

None of the organic constituents detected were found at concentrations exceeding the RCNs. The calculated risk and hazard levels were below the regulatory benchmarks. Therefore, from the perspective of the organics constituents, a release of fuel oil to soil has not occurred and a Phase II investigation is not warranted. Arsenic and chromium were detected above the BSLs and were the primary contributors to the elevated ELCRs and/or HIs. Formal statistical comparisons to background were performed for arsenic and chromium in WMU 22 soil. The results of the statistical analysis for arsenic (unpaired T Test) indicated that the mean arsenic concentration in WMU 22 soil is not significantly different from the mean background concentration. The results of the statistical analysis for chromium (unpaired T Test with Welch Correction) indicated that the mean chromium concentration in WMU 22 soil is not significantly different from the background mean concentration. Tetrachloroethylene (PCE) was found at concentrations within one (1) order of magnitude of the ELCR protection of groundwater benchmark. Groundwater is not used as a source of drinking water at the facility, as water service is provided by the City of Granville. As a conservative measure, a groundwater restriction for use as drinking water to a depth of forty (40) feet will be completed through implementation of an environmental covenant. A Phase II investigation is not warranted because a release of fuel oil to soil has not occurred, the available metals data indicate that the existing arsenic data and chromium levels are similar to the naturally occurring background levels, and there are no significant impacts to the environment at WMU 22.

As this UST has been appropriately removed, with all activities documented, in conjunction with the results of the additional soil sampling completed for the RFI, and with completion of the groundwater use restriction, it has been determined that WMU 22 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) UST used to store fuel oil. 2) UST removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) UST did not manage hazardous wastes. 5) Odor present in excavation pit during tank removal. 6) Soil sampling completed. 7) VOCs, SVOCs, arsenic and chromium constituents. 8) Formal statistical analyses to compare means to background for arsenic and chromium.	1) Direct contact ELCR and HI > benchmarks, due to arsenic. 2) Protection of groundwater ELCR > benchmark, due to arsenic; HI > benchmark, due to arsenic and chromium. 3) Formal statistical evaluation indicates that the arsenic and chromium mean concentrations are not significantly different from the background mean concentrations. 4) PCE within 1 order of magnitude of ELCR for protection of groundwater benchmark.	1) Unpaired T Test indicates that the arsenic mean concentration is not significantly different from the background mean concentration, no further action. 2) Unpaired T Test with Welch Correction indicates that the chromium concentration is not significantly different from the background mean concentration, no further action. 3) USTs removed and appropriately closed. 4) As a conservative measure, a Site-wide groundwater use restriction for drinking water to a depth of 40 ft. will be completed.	1) Site-wide groundwater use restriction for drinking water to a depth of 40 ft.

4.7.26 WMU 23 – UST at Building 72

This UST was used to store fuel oil and did not manage hazardous waste. The UST was removed during the period April through December 1988. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed.

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As this UST has been appropriately removed with all activities documented, it has been determined that WMU 23 is not a potentially significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) UST used to store fuel oil. 2) UST removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) UST did not manage hazardous wastes.	1) Releases known to have occurred at some USTs, but no evidence of a release during tank removal activities. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) USTs removed and appropriately closed, no further action.	1) No further action.

4.7.27 WMU 24 – UST at Building 73

This UST was used to store fuel oil and did not manage hazardous waste. The UST was removed during the period April through December 1988. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed.

As this UST has been appropriately removed with all activities documented, it has been determined that WMU 24 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) UST used to store fuel oil. 2) UST removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) UST did not manage hazardous wastes.	1) Releases known to have occurred at some USTs, but no evidence of a release during tank removal activities. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) USTs removed and appropriately closed, no further action.	1) No further action.

4.7.28 WMU 25 – UST at Building 75

This UST was used to store fuel oil and did not manage hazardous waste. The UST was removed during the period April through December 1988. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed.

As this UST has been appropriately removed with all activities documented, it has been determined that WMU 25 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) UST used to store fuel oil. 2) UST removed in 1988 and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) UST did not manage hazardous wastes.	1) Releases known to have occurred at some USTs, but no evidence of a release during tank removal activities. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) USTs removed and appropriately closed, no further action.	1) No further action.

4.7.29 WMU 26 – Current Paper Incinerator

The current paper incinerator was installed in 1988 and is operated under an Ohio EPA Notice of Registration # 0145000234 N002 approved on September 23, 1988. The incinerator is used to burn paper and has not managed hazardous waste. The unit is immediately west of the quarry road and between the south quarry ponds and the HAJJ Pad. The incinerator is powered by natural gas with a permitted capacity of 100 pounds of paper per day. No other wastes are disposed in the incinerator. There have been no documented releases from the unit. A shallow soil investigation will be completed to determine if a release had occurred.

Initially a single soil sample from the 0-2 ft. depth was collected and sent for analysis. Four (4) additional soil samples from the 0-2 ft. depth were determined to be needed and the locations were off-set from the initial sampling point by ten (10) feet in all directions. No VOCs were detected. The only SVOC detected above the laboratory reporting limit was dimethyl phthalate. Various metals were detected with arsenic, copper, lead, and thallium found to exceed the BSLs and would require further evaluation.

The direct contact ELCR was calculated to be 1E-4 and the HI was calculated to be 2, each of which exceeds the established benchmarks. Arsenic was the most significant contributor to the elevated ELCR and HI.

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The protection of groundwater ELCR was calculated to be $2E-3$ and the HI was calculated to be 20, each of which exceeds the established benchmarks. Arsenic was the only significant contributor to the elevated ELCR and arsenic and thallium were the significant contributors to the elevated HI.

None of the organic constituents detected in soil were found at concentrations that were above the RCNs. The calculated risk and hazard levels were below the regulatory benchmarks. Therefore, from the perspective of organic constituents, a release to soil has not occurred and a Phase II investigation is not warranted. As arsenic, copper, lead, and thallium were above the BSLs, copper and lead were found to be below the RCNs and were not evaluated further. Formal statistical comparisons to background were performed for arsenic and thallium. The results of the statistical analysis for arsenic (unpaired T Test) indicated that the mean arsenic concentration in WMU 26 soil is not significantly different from the mean background concentration. The results of the statistical analysis for thallium (unpaired T Test with Welch Correction) indicated that the mean thallium concentration in WMU 26 soil is not significantly different from the background mean concentration. A Phase II investigation is not warranted because a release to soil has not occurred, as the available metals data indicate that the existing arsenic and thallium levels are similar to the naturally occurring background levels, and there are no significant impacts to the environment at WMU 26.

It has been determined that WMU 26 is not considered to be a significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Paper documents burned in unit from 1988 to present.</p> <p>2) Surface soil samples collected and analyzed.</p> <p>3) All VOCs and SVOCs below detection limits, except dimethyl phthalate.</p> <p>4) Arsenic, copper, lead, thallium > BSL, but copper and lead < RCN so not further evaluated.</p> <p>5) Formal statistical evaluation for comparison of arsenic and thallium data to background data.</p> <p>6) Groundwater not used as a source for drinking water at the facility.</p> <p>7) Arsenic and thallium are naturally occurring.</p>	<p>1) Direct contact ELCR and HI > benchmarks, due to arsenic.</p> <p>2) Protection of groundwater ELCR > benchmark, due to arsenic; HI > benchmark, due to arsenic and thallium.</p> <p>3) Arsenic mean concentration found to not be significantly different from background mean concentration.</p> <p>4) Thallium mean concentration found to not be significantly different from background mean concentration.</p>	<p>1) Unpaired T Test indicated that the arsenic mean concentration was not significantly different from background mean concentration, no further action.</p> <p>2) Unpaired T Test indicated that the thallium mean concentration was not significantly different from background mean concentration, no further action.</p>	<p>1) No further action.</p>

4.7.30 WMU 27 – Building 20 to 22 Complex – Former Neutralization Basin to Include the Basin, Lines, and Ravine

Beginning in the late 1970s, WMU 27 was a neutralization basin that was used to collect non-sanitary water from sinks and floor drains located in the western portion of the research and development complex (Buildings 20, 21, 22) prior to discharge to the ravine. The basin consisted of a concrete pit with a gravel floor. The basin was

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removed and lines from the buildings rerouted to the wastewater treatment plant in the mid 1980s. Review of available records could not confirm this unit managed hazardous wastes; however, wastewater generated from research and development operations likely contained hazardous constituents. There were no documented releases from this unit, but the potential for releases to have occurred existed because engineered controls to prevent a release were not in place. Since WMU 27 could serve as a potential source of contamination, further actions were conducted to determine if a release to soil, sediment, and/or surface water had occurred.

Three (3) soil sampling locations were completed west of Building 22 and east of the unnamed tributary to confirm/deny whether a release had occurred to the soil at this unit. Three (3) samples were collected from each boring, except for one (1) location where the water table was at approximately seven (7) feet. Two (2) surface water samples and two (2) sediment samples were initially collected from the unnamed tributary that is located just west of the former basin. Three (3) additional sediment samples were collected and analyzed for specific metals.

Soil

Several VOCs were detected but all were qualified as having estimated concentrations that were below the reporting limits and/or were known common laboratory contaminants. No SVOCs were detected. Various naturally occurring metals were detected. Copper was the only constituent that was found to be greater than the BSL, but copper was less than the RCN and would not be evaluated further.

The direct contact ELCR was calculated to be $5E-9$ and the HI was calculated to be 0.01, both of which are below their benchmarks.

The protection of groundwater ELCR was calculated to be $1E-6$ and the HI was calculated to be 0.1, each of which are below their benchmarks.

Therefore, a release to soil has not occurred and a Phase II investigation of soils is not warranted.

Sediment

VOCs were not detected in the initial two (2) sediment samples and the associated duplicate. Various SVOCs, including benzo(a)pyrene, were detected in the initial samples and duplicate, but all were qualified as having estimated concentrations that were below the reporting limits and/or were known common laboratory contaminants.

Several naturally occurring metals were detected in the initial sediment samples and duplicate collected from this unit. Based on the results of the initial sediment sampling

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event, three (3) additional sediment samples and a field duplicate were collected to confirm/deny if a release to the sediment had occurred. The additional samples were analyzed for only cadmium, copper, lead, nickel, silver, and zinc. All sediment metal values that were greater than the BSLs were compared to the associated RCNs. Arsenic was the only metal found to be above both the BSL and RCN, and would require additional evaluation.

The incremental ELCR was calculated to be $2E-4$ and the HI was calculated to be 5, each of which are greater than their benchmarks. Arsenic was found to be the primary contributor to the elevated ELCR and HI, and benzo(a)pyrene was found to be within one (1) order of magnitude of the HI benchmark. The maximum detected concentration of arsenic was found to be greater than the BSLs, but within the range of site-specific background concentrations. Formal statistical evaluations (nonparametric Mann-Whitney Test and unpaired T Test) were performed for the arsenic in sediment data. The statistical evaluations indicated that the median and mean arsenic concentrations for WMU 27 sediment are not significantly different from the background median and mean. Since the data set for arsenic in sediment at WMU 27 was so small (two (2) points), the unit sediment data were combined with the site-wide sediment data, including WMUs 7, 12, and 30, and that combined data set was compared to the background data. The results of the statistical analysis (nonparametric Mann-Whitney Test) indicated that the median arsenic concentration for the site-wide sediment data is not significantly different from the background median concentration. Based on these results and observation, there are no significant impacts to the environment, a release to sediment has not occurred, and a Phase II investigation is not warranted.

Surface Water

VOCs were detected in surface water, but all were qualified as having estimated concentrations that were below the reporting limits and/or were known common laboratory contaminants. No SVOCs were detected. Various naturally occurring metals were detected, including barium, calcium, and thallium. Of the metals detected, all were found to be below the BSLs and were excluded from further consideration.

As acetone was the only constituent found to be above the RCN and is considered to be noncarcinogenic, an ELCR could not be calculated. The total HI was calculated to be 0.0002, which is well below the established benchmark of 1.0. Therefore, a release to surface water has not occurred and a Phase II investigation of the surface water is not warranted.

It has been determined that WMU 27 is not considered to be a significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Soil, sediment, and surface water investigated.</p> <p>2) Unit in operation from 1970s to 1980s.</p> <p>3) Additional sediment samples collected and analyzed for specified metals.</p> <p>4) Soil ELCR and HI < benchmarks for direct contact and protection of groundwater.</p> <p>5) Sediment ELCR and HI > benchmarks.</p> <p>6) Acetone only surface water constituent, no ELCR and HI < benchmark.</p> <p>7) Formal statistical analyses for arsenic in sediment to background.</p> <p>8) Benzo(a)pyrene in sediment within 1 order of magnitude of screening benchmark.</p>	<p>1) Sediment ELCR and HI > benchmarks, due to arsenic.</p> <p>2) Formal statistical evaluations for arsenic in sediment to both median and mean background comparisons for unit and site-wide combined data indicate no significant differences.</p>	<p>1) Nonparametric Mann-Whitney Test indicates that median arsenic concentration is not significantly different from background median concentration in sediment, no further action.</p> <p>2) Unpaired T Test indicates that mean arsenic concentration is not significantly different from mean background concentration in sediment, no further action.</p> <p>3) Nonparametric Mann-Whitney for unit and sit-wide combined data compared to background indicates no significant difference between median arsenic concentration for the combined data from the background concentration in sediment, no further action.</p>	<p>1) No further action.</p>

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4.7.31 WMU 28 – Septic Tank and Leach Well for Building 75

WMU 28 was a septic tank and leach well that serviced sanitary and non-sanitary waste from Building 75. This unit also managed small quantities of hazardous wastes generated from operations in Building 75. The septic tank and leach well were located on the west side of Building 75. The system operated from the time Building 75 was built in the early 1960s until the mid 1990s when a waste discharge line from Building 75 was connected to the wastewater treatment plant. A drain line servicing a portion of Building 75 formerly discharged to the ravine east of the building (see WMU 30). There were not documented releases, but the potential for a release to have occurred existed because there were no environmental controls in place. Further action was conducted to determine if a release to the soil had occurred.

Four (4) soil sampling locations on each side of the unit were selected with three (3) samples collected from each boring. There was no water table present at any of the borings as bedrock was encountered prior to water. Various VOCs were detected in the samples, but all were qualified as having estimated concentrations that were below the reporting limits and/or are known common laboratory contaminants. Bis(2-ethylhexyl)phthalate was the only SVOC detected in the soil samples. This SVOC was qualified as having estimated concentrations that were below the reporting limits and is known as a common laboratory contaminant. Various naturally occurring metals were detected in the soil samples. Arsenic, chromium, and copper were found to be greater than the BSLs, but copper was found to be less than the RCN and would not require further evaluation.

The direct contact ELCR was calculated to be $1E-4$ and the HI was calculated to be 3, each of which is greater than the established benchmarks. Arsenic was the primary contributor to the elevated ELCR and HI.

The protection of groundwater ELCR was calculated to be $3E-3$ and the HI was calculated to be 30, each of which exceeds the established benchmarks. Arsenic was the only constituent with an individual ELCR exceeding $1E-5$, and arsenic and chromium were the only constituents with individual HIs exceeding 1.0. It should be noted that chromium VI defaults were used in the calculations as a very conservative measure.

None of the organic constituents detected in soil were found at concentrations that exceeded the RCNs. The calculated risk and hazard levels were below the regulatory benchmarks. Therefore, from the perspective of the organic constituents, a release to soil has not occurred and a Phase II investigation is not warranted. Formal statistical comparisons to background were performed for arsenic and chromium in soil. The results of the statistical analyses for arsenic and chromium (unpaired T Test with Welch Correction on the ln-transformed data for both) indicated that the mean arsenic and

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chromium concentrations in the WMU 28 soil are both significantly higher than the mean background concentrations. However, the potential impact to human health and/or the environment is unlikely based on the facts that no one resides on this portion of the facility, bedrock is encountered prior to a saturated zone sufficient for potable use, and a facility-wide groundwater restriction for use as drinking water to a depth of forty (40) feet will be completed. Thus, the potential pathways will be eliminated or extremely limited for any applicable receptors. Should Owens Corning ever wish to relinquish oversight/control of the WMU 28 area or wish to allow someone to reside on the area of the unit, notification to Ohio EPA of Owens Corning's intentions and reassessment of the unit will be necessary at that time. Any reassessment will be limited to identifying what, if any, actions will be needed with respect to the arsenic present in the soil at WMU 28. If Owens Corning wishes to develop the WMU 28 area for commercial or industrial use, Ohio EPA must be notified but Ohio EPA will not require further investigation or remediation of the WMU 28 area.

Based on the analytical results and observations, and with implementation of the groundwater use restriction, it has been determined that WMU 28 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Unit managed small quantities of hazardous wastes.</p> <p>2) Unit operated from early 1960s to mid 1990s.</p> <p>3) Septic tank and leach well system.</p> <p>4) No engineered controls in place.</p> <p>5) No VOCs or SVOCs > RCNs.</p> <p>6) Arsenic and chromium (VI defaults) > RCNs, but naturally occurring.</p> <p>7) Bedrock encountered prior to saturated zone/groundwater.</p> <p>8) Area under control of Owens Corning.</p> <p>9) Formal statistical evaluation completed for arsenic and chromium to background.</p> <p>10) Chrome VI defaults used as a conservative measure.</p>	<p>1) Direct contact ELCR and HI > benchmarks, due to arsenic.</p> <p>2) Protection of groundwater ELCR > benchmark, due to arsenic; HI > benchmark, due to arsenic and chromium.</p> <p>3) Formal statistical evaluation completed for arsenic and chromium to background indicate each are higher than background concentrations.</p>	<p>1) Unpaired T Test with Welch Correction on the ln-transformed data indicates the mean concentrations for arsenic and chromium are significantly higher than background concentrations. But constituents are naturally occurring and most likely not due to a release.</p> <p>2) Potential pathways are limited and/or eliminated due to intended land use and groundwater use restriction.</p> <p>3) Site-wide groundwater use restriction for drinking water to a depth of 40 feet.</p>	<p>1) Site-wide groundwater use restriction for drinking water to a depth of 40 feet.</p> <p>2. If control of unit to be relinquished and/or changed to residential use, Ohio EPA to be notified prior to desired change(s) for reassessment of unit.</p> <p>3) Any reassessment will be limited to the arsenic present in the soil.</p> <p>4) If Owens Corning determines to develop the Unit for commercial or industrial use it will be necessary to notify Ohio EPA but no further investigation or remediation will be required.</p>

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4.7.32 WMU 29 – Septic Tank and Leach Well for Building 76

WMU 29 was a septic tank and leach well that serviced sanitary and non-sanitary waste from Building 76. This septic system was located northwest of Building 76. The unit managed small quantities of hazardous wastes generated from operations in Building 76. The unit was in operation from the time Building 76 was built in the 1960s until the system was abandoned and the drain lines connected to the current wastewater treatment system in the mid 1990s. The potential for releases to have occurred exists because no engineered controls to prevent a release were in place. Further action was conducted to determine if a release to soil had occurred.

Four (4) soil sampling locations on each side of the unit were selected with three (3) samples collected from two (2) borings and two (2) samples collected from the others due to auger refusal at approximately ten (10) feet. There was no water table present at any of the borings as bedrock/auger refusal was encountered prior to water. 1,1-Dichloroethane was detected, but the results were qualified as having estimated concentrations that were below the reporting limit. No other VOCs were detected. Bis(2-ethylhexyl)phthalate was detected, but the results were qualified as having estimated concentrations that were below the reporting limits and it is known as a common laboratory contaminant. Various naturally occurring metals were detected. The maximum metal concentrations were compared to the BSLs and only arsenic and beryllium were found to be greater than the BSLs. These metals were then compared to the RCNs and only arsenic was found to be greater than the RCN requiring further evaluation.

The direct contact ELCR was calculated to be $1E-4$ and the HI was calculated to be 3, each of which exceeds their benchmarks. Arsenic was found to be the only significant contributor to the elevated ELCR and HI.

The protection of groundwater ELCR was calculated to be $2E-3$ and the HI was calculated to be 20, each of which exceeds the established benchmarks. Arsenic was the only significant contributor to the elevated ELCR and HI.

None of the organic constituents detected were found to be above the RCNs. The calculated risk and hazard levels were below the regulatory benchmarks. Therefore, from the perspective of organic constituents, a release to soil has not occurred and a Phase II investigation is not warranted. Arsenic was the primary contributor to the elevated ELCRs and HIs. A formal statistical evaluation (unpaired T Test with Welch Correction on the ln-transformed data) indicated the mean arsenic concentration in WMU 29 soil is not significantly different from the background mean. A Phase II investigation is not warranted because a release of inorganic constituents to soil has not occurred, as the available metals data indicate that the existing arsenic level is similar to

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the naturally occurring background levels, and there are no significant impacts to the environment.

Based on the analytical results, it has been determined that WMU 29 is not a potentially significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Unit managed small quantities of hazardous wastes. 2) Unit operated from early 1960s to mid 1990s. 3) Septic tank and leach well system. 4) No engineered controls in place. 5) No VOCs or SVOCs > RCNs. 6) Arsenic and beryllium > BSLs, but beryllium < RCN. 7) Bedrock encountered prior to saturated zone/groundwater. 8) Formal statistical evaluation completed for arsenic. 9) Arsenic is naturally occurring.	1) Direct contact ELCR and HI > benchmarks, due to arsenic. 2) Protection of groundwater ELCR and HI > benchmark, due to arsenic. 3) Formal statistical evaluation completed for arsenic to background indicate means not significantly different.	1) Unpaired T Test with Welch Correction on the ln-transformed data indicates the mean concentrations for arsenic and the background data are not significantly different, no further action.	1) No further action.

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4.7.33 WMU 30 – Ravine East of Building 75 Where the Drain Line from this Building Formerly Discharged

WMU 30 includes the ravine east of Building 75 where a terra cotta drain line from Building 75 formerly discharged. It is likely that small quantities of hazardous wastes could have been discharged through the drain line. The drain serviced the mechanical room and the cooling tower from the early 1960s. Usage of the drain lined stopped when the mechanical room ceased operation and the cooling tower was removed; however, it is not known when this occurred. The potential for releases to have occurred existed because engineered controls to prevent a release were not in place. Further action was conducted to determine if a release to soil, sediment, or surface water had occurred.

Three (3) soil sampling locations were originally planned for this unit. Upon implementation of the sampling activities, it was determined that the locations were too steep and overhead lines were present so the drill rig could not be used. The scope of work was changed with concurrence from all involved and a single soil sampling location downgradient of the former drainage pipe discharge point was selected. A hand auger was used to collect this soil sample from the 0-2 foot depth. Two (2) sediment samples and two (2) surface water samples were collected from the unnamed tributary that is located east of Building 75 and the former drain line.

Soil

1,1-Dichloroethane and carbon disulfide were detected in the soil sample. Both of these VOC constituents were qualified as having estimated concentrations that were below the detection limits. No other VOCs were detected in the soil sample. Bis(2-ethylhexyl)phthalate, fluoranthene, and phenanthrene were detected in the soil sample, but all were qualified as having estimated concentrations that were below the reporting limits and/or were known common laboratory contaminants. No other SVOCs were detected. Various naturally occurring metals were found in the soils at this unit. Beryllium was the only metal found to be greater than the BSLs.

The direct contact ELCR was calculated to be 6E-9 and the HI was calculated to be 0.007, each of which are below the established benchmarks.

The protection of groundwater was calculated to be 6E-10 and the HI was calculated to be 0.03, each of which are below the established benchmarks.

Therefore, a release to soil has not occurred and a Phase II investigation of soils is not warranted.

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Sediment

Methylene chloride was detected in one (1) sediment sample. This detection was qualified as having an estimated concentration that is below the reporting limit and methylene chloride is a known common laboratory contaminant. No other VOCs were detected in the sediment samples. Bis(2-ethylhexyl)phthalate was detected in one (1) sediment sample. This detection was qualified as having an estimated concentration that was below the reporting limit. No other SVOCs were detected in the sediment samples. Various naturally occurring metals were detected in the sediment. No metals were detected above their BSLs in the sediment that would require further evaluation.

The incremental ELCR was calculated to be $2E-9$ and the HI was calculated to be 0.00006, each below the established benchmarks. Based on these results, there are no significant impacts to the environment, a release to sediment has not occurred, and a Phase II investigation is not warranted.

Surface Water

1,1-Dichloroethane and trichloroethene were detected in the surface water samples. Both of these detections were qualified as having estimated concentrations that were below the detection limits. No other VOCs were detected in the surface water. No SVOCs were detected in the surface water. Various naturally occurring metals were detected in the surface water. No metals were found in surface water to be greater than the BSLs that would require further evaluation.

The total ELCR was calculated to be $2E-7$ and the HI was calculated to be 0.03, each of which are below the established benchmarks. Based on these results, there are no significant impacts to the environment, a release to surface water has not occurred, and a Phase II investigation is not warranted.

It has been determined that WMU 30 is not considered to be a significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) Soil, sediment, and surface water investigated. 2) Unit began operations in early 1960s and cessation date is not known. 3) Beryllium only metal found in soil > BSL. 4) No other constituents found at unit > RCNs.	1) Beryllium in soil < RCN. 2) Soil direct contact and protection of groundwater < ELCR and HI benchmarks. 3) Sediment total ELCR and HI < benchmarks. 4) Surface water total ELCR and HI < benchmarks.	1) No further action.	1) No further action.

4.7.34 WMU 31 – Fuel Oil USTs

WMU 31 consisted of six (6) fiberglass USTs (4-10,000 gallon and 2-12,000 gallon) that were used to store #2 fuel oil for heating purposes and did not manage hazardous waste. The USTs were located southeast of the Weathering Farm Landfill and west of AOC 1. No information was available regarding the date of installation of the tanks. The USTs were removed in the late 1980s, but tank closure data could not be located to confirm/deny whether evidence of a release was documented. Thus, WMU 31 was investigated to determine whether a release had occurred.

Two (2) soil sampling locations were selected from each end of the former tank pit to confirm/deny whether a release had occurred at this unit. Acetone was detected in one sample, but was qualified as having an estimated concentration that was below the reporting limit and it is known as a common laboratory contaminant. No other VOCs were detected. Bis(2-ethylhexyl)phthalate and 4-methylnaphthalene were detected in the soil samples, but each were qualified as having estimated detection limits and are known as common laboratory contaminants. No other SVOCs were detected. PCB Aroclor 1248 was detected in a single soil sample at the 0-2 foot depth. Various naturally occurring metals were detected in the soil. Chromium was the only metal found to be greater than the BSL and would be evaluated further. As a conservative measure, the chromium defaults for chromium VI were used.

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The direct contact ELCR was calculated to be $7E-7$ and the HI was calculated to be 0.2, each of which is below the established benchmarks.

~~The protection of groundwater ELCR was calculated to be $1E-5$ (rounded down from $1.20E-5$) which is equal to the established benchmark if rounded to one significant figure. Aroclor 1248 was the primary contributor to the elevated ELCR. The total HI was calculated to be 4, which exceeds the established benchmark of 1.0. Chromium was the primary contributor to the elevated HI.~~

The direct contact ELCR and HI are acceptable. The protection of groundwater ELCR was elevated due to Aroclor 1248 and the HI was elevated due to chromium. A formal statistical comparison (unpaired T Test with Welch Correction on the ln-transformed data) to background for chromium was completed. The statistical analysis indicated that the mean chromium concentration for WMU 31 is not significantly different from the background mean. The only other constituent with an individual ELCR exceeding the screening benchmark was Aroclor 1248. This PCB constituent was detected only once in the six (6) samples collected at this unit. The only other detection of Aroclor 1248 was one (1) result at WMU 14. The site-wide frequency of detections for Aroclor 1248 was only two (2) percent, which is below the five (5) percent presented in the *CPRG (Ohio EPA 2006)* as a minimum frequency of detection indicated for remedial action. Based on the low frequency of detection, the potential impact to groundwater is not of concern, and the results of the direct contact scenario were within acceptable limits. Aroclor 1248 was detected in the 0-2 foot interval and the uppermost saturated zone/groundwater at this unit was determined to be at the fifty-two (52) foot depth. The properties of Aroclor 1248 (not very soluble in water and high organic carbon partition coefficient) contribute to the limited mobility expected of this constituent, and with the depth to groundwater at fifty-two (52) feet, Aroclor 1248 would not be expected to migrate through the soil column to the groundwater. No groundwater at the facility is used as a source for drinking water and an environmental covenant will be completed that will restrict groundwater use for drinking water purposes to a depth of forty (40) feet. Based on the results of these analyses and observations, there are no significant impacts to the environment, a release of fuel oil to soil has not occurred, and a Phase II investigation is not warranted.

With implementation of the groundwater use restriction, it has been determined that WMU 31 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Six fiberglass USTs that stored #2 fuel oil for heating purposes.</p> <p>2) USTs removed in 1980s, but no documentation.</p> <p>3) No hazardous wastes managed in USTs.</p> <p>4) Soil samples collected from each end of tank cavity.</p> <p>5) Of metals detected, only chromium > BSLs, and is naturally occurring.</p> <p>6) VOCs and SVOCs detected, but <RCNs.</p> <p>7) PCB Aroclor 1248 detected in shallow soil (0-2 ft.).</p> <p>8) Upper saturated zone/groundwater found at 52 foot depth.</p> <p>9) Groundwater not used as drinking water source at facility.</p> <p>10) Formal statistical comparison for chromium levels to background levels.</p> <p>11) Chromium VI defaults used as conservative measure.</p>	<p>1) Direct contact ELCR and HI < benchmarks.</p> <p>2) Protection of groundwater ELCR > benchmark, due to Aroclor 1248, and HI > benchmark, due to chromium.</p> <p>3) Formal statistical evaluation indicated no significant difference in the chromium mean to background mean.</p> <p>4) Aroclor 1248 not very soluble in water and has a high organic carbon partition coefficient, which would limit migration through soil capabilities, especially to a depth of 52 feet.</p> <p>5) Aroclor 1248 site-wide detection frequency was 2%, while 5% detection frequency specified in CPRG for remedial action.</p> <p>6) Groundwater not used as a source of drinking water at the facility.</p>	<p>1) Unpaired T Test with Welch Correction on In-transformed data indicated that the chromium mean was not significantly different from the background mean, no further action.</p> <p>2) Aroclor 1248 site-wide detection frequency was 2%, while 5% detection frequency is minimum specified in CPRG for remedial action, no further action.</p> <p>3) As a conservative measure, a site-wide groundwater use restriction for drinking water to a depth of 40 feet will be completed.</p>	<p>1) Site-wide groundwater use restriction for drinking water to a depth of 40 ft.</p>

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4.7.35 WMU 32 – USTs at Former Granville Aggregates Building

These USTs were used to store diesel fuel and gasoline and did not manage hazardous wastes. Releases from some of the USTs at the facility were known to have occurred and were included as a part of the closure activities previously completed and reviewed. Based upon review of available records, there were no documented releases and no evidence of a release was detected when the tanks were removed.

As this UST has been appropriately removed with all activities documented, it has been determined that WMU 32 is not a potentially significant source of contamination and no further action is required.

Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
1) USTs used to store diesel fuel and gasoline. 2) USTs removed and activities documented. 3) Releases from some USTs known to have occurred, but were included as a part of the closure activities. 4) UST did not manage hazardous wastes.	1) Releases known to have occurred at some USTs, but documentation does not provide evidence of a release. 2) Release associated activities/excavations included with tank closure activities and associated documentation.	1) USTs removed and appropriately closed, no further action.	1) No further action.

4.7.36 AOC 1 – Former Tank Testing Area

AOC 1 was a pit used to perform tank tightness tests on plastic/fiberglass tanks. Tanks were filled with water and pressurized. The pit was also used as an area to test the burn characteristics of tanks. The pit was operational in the general time period from the mid 1960s to the late 1980s. Naphtha was used at this unit for burning test materials on a concrete pad during a one-time event. The pit has been filled with soil. AOC 1 was located south-southeast of the Weathering Farm Landfill. There were no documented releases from this unit and the potential for a release to have occurred is low due to the flammable nature of naphtha. Limited soil sampling was conducted to confirm/deny whether a release had occurred.

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One (1) soil sampling location was selected at the northwest side of the former tank testing pit in the direction of groundwater flow and three (3) soil samples were collected. VOCs 1,1-dichloroethene and benzene were detected, but each was qualified as having estimated concentrations that were below the reporting limits. No other VOCs were detected. SVOCs 4-methylnaphthalene, naphthalene, and phenanthrene were detected, with each being qualified as having estimated concentrations that were below the reporting limits. No other SVOCs were detected. Various naturally occurring metals were detected in the soils at the unit. No metals were found to be above the BSLs, except for thallium which would be further evaluated.

The direct contact ELCR was calculated to be $6E-10$ and the HI was calculated to be 0.3, each of which is below the established benchmarks.

The protection of groundwater ELCR was calculated to be $2E-7$ which is below the established benchmark. The protection of groundwater HI was calculated to be 1.46, which is greater than the established hazard index screening benchmark of 1.0. Thallium was the only constituent with an individual HI greater than 1.0.

None of the organic constituents detected in soil were found at concentrations that were above the RCNs. The calculated risk and hazard levels did not exceed the regulatory benchmarks. Therefore, from the perspective of the organics, a release to soil has not occurred and a Phase II investigation is not warranted. Thallium was detected at a maximum concentration of 2.1 mg/kg, slightly above the BSL of 1.8 mg/kg, but below the maximum detected background concentration of 2.5 mg/kg. Formal statistical comparisons (unpaired T Test and nonparametric Mann-Whitney Test) indicated the mean and median thallium concentrations in AOC 1 are not significantly different from the background mean and median concentrations, respectively. Based on these results and observations, there are no significant impacts to the environment, a release to soil has not occurred, and a Phase II investigation is not warranted.

It has been determined that AOC 1 is not a potentially significant source of contamination and no further action is required.

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Investigation Activities and Results	Environmental Concerns based on Investigation	Owens Corning Proposed Remedy to Address Concerns	Ohio EPA Proposed Remedy to Address Concerns
<p>1) Pit in ground used for tank tightness testing.</p> <p>2) Pit used one-time for materials/product burn testing using naphtha as accelerant.</p> <p>3) Pit use began in mid 1960s and ended in late 1980s.</p> <p>4) No documented releases, but soil sampling completed.</p> <p>5) VOCs and SVOCs detected, but < RCNs.</p> <p>6) Thallium only metal > BSL, but < maximum background concentration.</p> <p>7) Formal statistical comparisons of thallium median and mean concentrations to background concentrations.</p> <p>8) Groundwater is not a source of drinking water at facility.</p>	<p>1) ELCR and HI for direct contact and ELCR for protection of groundwater < benchmarks.</p> <p>6) HI for protection of groundwater > benchmark, due to thallium.</p> <p>7) Formal statistical comparisons of thallium median and mean concentrations to background median and mean concentrations.</p> <p>4) Groundwater is not a source of drinking water at the facility.</p>	<p>1) Unpaired T Test and nonparametric Mann-Whitney Test indicated mean and median concentrations are not significantly different from the background mean and median concentrations, no further action.</p>	<p>1) No further action.</p>

4.7.37 Biota and Fish Tissue Sampling and Analyses (BERA)

Based on the results from the initial phases of the RFI completed in 2002, it was determined potential risks to benthic invertebrates due to lead in the sediment in the vicinity of WMU 27 and potential risks to aquatic feeding wildlife due to PCBs in stream habitat downstream of the on-site wastewater treatment system would need additional investigation. In 2003, additional sampling and analyses were conducted and a BERA was completed to address these concerns. These were the only items identified in the SERA as requiring the investigation of potential ecological risks beyond the screening level evaluation. The BERA incorporates site-specific data collected to investigate the bioavailability and bioaccumulation of lead and PCBs. The BERA is conservative and is more likely to overestimate than underestimate ecological risks.

Lead

Three (3) additional stream sediment samples were collected from the area near WMU 27 and analyzed for lead. These samples were collected based on a previous single analytical result of 240 mg/kg. An extraction method endorsed by *USEPA (2000)* reportedly provides a better indication of the bioavailability fraction of lead in sediment (Allen, FU et al. 1993) than the commonly used USEPA extraction method 5030. Specifically, *USEPA (2000)* recommends analyzing acid volatile sulfide (AVS) and simultaneously extracted metals (SEM), together with total organic carbon (TOC), to support the evaluation of lead bioavailability in sediment.

Concentrations of total lead in all three (3) sediment samples collected near WMU 27 were below the reporting limit of 24 mg/kg, in contrast to the previously reported detection of 240 mg/kg total lead in sediment from the same area. The August 2003 results for total lead are consistent with the finding that lead concentrations in sediment elsewhere at the facility are within the range of naturally occurring background concentrations. These results indicate that either (1) elevated lead concentrations in the vicinity of WMU 27 are of very limited spatial extent, or (2) the reported concentration of 240 mg/kg lead was an analytical outlier that does not represent site conditions.

It has been determined that the lead in sediment does not pose a risk to benthic invertebrates at the site. The single elevated lead concentration measured in 2002 was not confirmed in the subsequent sampling of the same area, and bioavailable lead concentrations measured in 2003 were not high enough to cause adverse effects. Any occurrences of elevated lead concentrations are not sufficiently widespread to affect benthic community structure and function.

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PCBs

The 2002 stream sediment results indicated the presence of PCBs in sediment downstream of the wastewater treatment system that were greater than ecological screening values but less than human health screening values, per the Aroclor-based analyses. Thus, three (3) additional co-located sediment and biota tissue samples were collected from three (3) sampling zones located downstream of the wastewater treatment system in 2003. The sediment samples were analyzed for PCB-Homologues, which measures the PCBs based on their level of chlorination. Homologue analyses reportedly provide superior data quality compared to Aroclor analyses. Additionally, homologue analyses provide site-specific information on the composition of PCB mixtures, which is relevant to the interpretation of wildlife toxicity values for different total PCB exposures.

Biota samples were collected from the same three (3) in-stream sampling zones as the associated sediment samples. Three (3) biota samples representing benthic invertebrates, small whole fish, and medium whole fish were collected from each zone. Crayfishes were collected to represent invertebrate prey, because they were the dominant, large benthic invertebrate in each sampling zone. Each biota sample was a composite sample to satisfy sample volume requirements. Fish species were mixed (minnows, darters, chubs) representing available prey within each sampling zone. Each sample was analyzed for PCB-homologues and lipid content.

PCBs were not detected in sediment or invertebrates from any of the three (3) sampling zones. Three (3) of six (6) fish tissue samples contained detectable concentrations of PCBs. The lack of detectable PCBs in sediment contrasts with previously reported results indicating detectable PCB concentrations in seven (7) of eight (8) samples collected downstream of the wastewater treatment system (2002). The cumulative reporting limits of PCB-homologues in the 2003 analyses are slightly higher than the concentrations detected in 2002 using the Aroclor-based methods. However, concentrations below the reporting limit but above the detection limit would have been reported as "J" qualified values in the homologue analyses. It is possible that the 2002 Aroclor analyses overestimated the total PCB concentrations, because Aroclor-based methods are subject to interferences and other uncertainties that do not affect homologue analyses. It was concluded that PCB concentrations in sediment and fish tissue from the stream do not pose a threat to wildlife at the site.

Although sediment samples previously collected from each of the on-site ponds contained no detectable concentrations of PCBs and no source of PCBs to the ponds has been identified, due to the detection of PCBs in certain sediment and biota tissue samples collected from stream habitat and because there is the potential for human and

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wildlife consumption of fish from the ponds, fish from four (4) of the large ponds were collected to assess exposure of wildlife and humans to PCBs potentially occurring in fish from these ponds.

Whole-body fish samples were analyzed to support ecological risk calculations for piscivorous (fish eating) wildlife receptors of interest identified for pond systems (belted kingfishers and mink). The PCB concentrations reported in fish from the on-site ponds were lower than the PCB concentrations previously measured in biota tissue samples from on-site streams. Because no significant ecological risks to piscivorous wildlife were associated with the previously collected PCB data, it is concluded that the fish tissue data will not change the overall results and conclusions of the BERA.

Based on the results and observations completed for the BERA and RFI, chemicals in the environmental media at the facility do not pose any significant risk to ecological receptors. No further action is warranted regarding these potential ecological risks at the facility.

5.0 CORRECTIVE MEASURES EVALUATION CRITERIA

5.1 Description of the Criteria

As part of the facility investigation/corrective measures/remedy study process, criteria for evaluating proposed remedies were developed by USEPA under the corrective action program of the Resource Conservation and Recovery Act (RCRA). The evaluation criteria are found in USEPA guidance documents. The criteria are used by Ohio EPA to evaluate the remedies proposed by a facility when the facility's investigation of environmental conditions on its property determines that some type of action is necessary to reduce the potential risk to human health and the environment posed by the presence of environmental contaminants to acceptable levels. The nine evaluation criteria are listed and described as follows:

- 1) **Protect human health and the environment** - Remedies shall be evaluated to determine if they can adequately protect human health and the environment, in both the short and long term, from unacceptable risks posed by environmental contaminants present at the facility.
- 2) **Attain media cleanup standards set by the implementing agency** - Remedies shall be evaluated to determine if the final numerical standards for the subject environmental media will be achieved. The evaluation will include the method of verification, and its supporting quality assurance and quality control procedures, used to make the determination.
- 3) **Control source of the release(s) to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment** - Remedies shall be evaluated to determine if it is practicable

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to physically remove the source of environmental contamination as part or all of a remedy.

- 4) **Comply with applicable standards for management of waste** - Remedies shall be evaluated to determine if they meet all of the applicable requirements of state, federal, and local environmental laws for waste management.
- 5) **Long term reliability and effectiveness** - Remedies shall be evaluated to determine their ability to maintain reliable protection of human health and the environment over time once the measure is fully implemented. This includes assessment of the residual risks remaining from untreated wastes and the adequacy and reliability of controls such as containment systems and enforceable land use restrictions.
- 6) **Reduction in the toxicity, mobility or volume of wastes** - Remedies shall be evaluated to determine the degree to which recycling or treatment is utilized to reduce the toxicity, mobility, or volume of wastes present at the facility.
- 7) **Short term effectiveness** - Remedies shall be evaluated to determine the following: (1) short term risks that might be posed to the community during implementation of the remedy; (2) potential impacts on workers during implementation of the remedy and the effectiveness and reliability of worker protection measures; (3) potential environmental impacts of the remedy and the effectiveness and reliability of mitigative measures employed during implementation; and (4) time until protection is achieved.
- 8) **Implementability** - Remedies shall be evaluated to determine the ease or difficulty of implementation and shall include, as appropriate, the following: (1) technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of a technology, ease of undertaking additional remedies, and the ability to monitor the effectiveness of the remedy; (2) administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain and necessary approvals and permits, as necessary; and (3) the availability of any services and materials needed to support and complete the remedy.
- 9) **Cost** - Remedies shall evaluate capital costs, annual operation and maintenance costs, and the net present value of those costs. The cost estimates include only the direct costs of implementing the corrective measure. Cost estimates are provided in the Facility Investigation Report.

The first four (4) evaluation criteria are threshold criteria required for acceptance of a remedy. All four (4) of these criteria, as they are applicable, must be met in order for

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the remedy to be acceptable. The other five (5) evaluation criteria are the balancing criteria used to help select the best remedy. Ohio EPA's evaluations of the remedies that were already implemented by Owens Corning as interim measures and the final remedies, including no further actions, proposed by Owens Corning in the Facility Investigation Report are listed below in sections 5.2, 5.3, and 5.4.

5.2 Ohio EPA's Evaluations of the Interim Measures

WMU 4 (Building 63) was used to accumulate hazardous wastes for up to ninety (90) days while WMU 1 was undergoing RCRA closure. As an interim measure, the concrete floor of the building was power washed/rinsed. The rinse waters were collected and analyzed. This interim measure was not the only activity completed for this unit as soil samples were also collected from around the unit to fully characterize the area.

A small portion of WMU 9 (Test Homes Landfill) on the northeast side of the landfill showed signs of erosion on the cap. This small area was graded, seeded, and covered with ground mesh as the corrective measure. Several other activities were associated with the characterization of this unit.

An interim measure was completed at WMU 13 where the Mt. St. Helen's ash was disposed into Pond D. The pond was drained and the containers of Mt. St. Helen's ash were removed. Analytical results of the ash indicated it was not a hazardous waste and was similar to naturally occurring soils. The containers holding the ash were relatively intact and the waste ash was appropriately disposed off-site. The pond was allowed to refill and habitat common to the area and pond has re-established.

5.3 Ohio EPA's Evaluations of the Proposed Remedies

It has been determined that a Corrective Measures Study (CMS) would not be necessary for this project.

5.3.1 Site-Wide Groundwater

Facility groundwater data were combined and the EPC was calculated to use as a point of comparison to the RCNs for a residential drinking water scenario. The total ELCR was calculated to be 1E-3, which exceeds the benchmark of 1E-5. There were several constituents found to exceed the RCNs, but the primary contributor to the cancer risk was found to be arsenic. The total HI was calculated to be 170, which exceeds the benchmark of 1.0. There were several non-cancer risk drivers, with antimony being the primary contributor. The elevated constituents were predominately detected in the areas near the wastewater treatment system and the two (2) on-site landfills. Although both the cancer and non-cancer screening risk goals for the residential drinking water scenario were exceeded, upon assessment of the current facility groundwater exposure

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pathways, groundwater in this upper saturated zone is not used as a potable source and the facility is serviced by the Village of Granville municipal water supply. Thus, implementation of a site-wide groundwater use restriction for drinking water purposes to a depth of forty (40) feet below ground surface through completion of an environmental covenant; implementation of a land use restriction against residential or public access for the areas near WMU 7, WMU 8, and WMU 9 through completion of an environmental covenant; and implementation of an O&M Plan that will include long-term groundwater monitoring and maintenance of the restricted areas have been proposed as remedies to address any remaining groundwater associated concerns.

5.3.2 WMU 4 – Former Interim <90 Day Container Storage Area

There were no documented releases during the time of use as a hazardous waste storage area. The concrete floor was cleaned and rinse water analyzed. Engineered controls were in place to prevent releases to the soil. Soil samples collected and analyzed. ELCRs for direct contact and protection of groundwater exceed the benchmarks and the HI for protection of groundwater exceeds the benchmark, all due to arsenic. Arsenic is naturally occurring. The maximum detected concentration of arsenic in WMU 4 soil was 19.1 mg/kg, which is only slightly above the BSL of 19 mg/kg, but is below the maximum detected background concentration of 20.1 mg/kg. A formal statistical comparison (nonparametric Mann-Whitney Test) indicates the median arsenic concentration in soil exceeds the median arsenic concentration. Based on these observations, the statistical test results are likely due to an artifact of the small sample size of the data set, as the arsenic concentrations do not appear to be significantly elevated above the naturally occurring background levels. As a conservative measure, a site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet to be implemented through completion of an environmental covenant was proposed as a remedy to address any remaining concerns.

5.3.3 WMU 7 – Wastewater Treatment and Sewerage System

This wastewater treatment and sewerage system is currently used by the facility. The current system replaced a former system. Small quantities of hazardous wastes were disposed into these systems. Soil, sediment, and surface water samples were collected from this unit. The soil sample results indicated that the ELCRs and HIs for direct contact and protection of groundwater exceeded the benchmarks, all due to arsenic concentrations. Arsenic is naturally occurring. A formal statistical comparison (unpaired T Test on the ln-transformed data) of the mean arsenic concentration to background found that the arsenic mean in WMU 7 soil is not significantly different from the background mean concentration. As Owens Corning will need to maintain this system for use, a land-use restriction has been proposed to be implemented for this area through completion of an environmental covenant. A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet has also been proposed

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to be implemented through completion of an environmental covenant. An O&M Plan, to include long-term groundwater monitoring, that would be submitted to Ohio EPA for review and acceptance has also been proposed to be completed for this area.

5.3.4 WMU 8 – The Weathering Farm Landfill

This landfill received hazardous wastes. The landfill closure and capping, with Ohio EPA concurrence, was completed in 1984. Closure activities involved regrading and final capping of the landfill. The engineered cap consists of twelve (12) inches of compacted clay, a drainage layer consisting of twelve (12) inches of crushed stone, a geosynthetic filter fabric, and a final vegetative soil cover. A land-use restriction has been proposed to be implemented for this area through completion of an environmental covenant. A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet has also been proposed to be implemented through completion of an environmental covenant. An O&M Plan, to include long-term groundwater monitoring, that would be submitted to Ohio EPA for review and acceptance has also been proposed to be completed for this area.

5.3.5 WMU 9 – The Test Homes Landfill

This landfill received hazardous wastes. The landfill closure and capping, with Ohio EPA concurrence, was completed in 1984. Closure activities involved regrading and final capping of the landfill. The engineered cap consists of twelve (12) inches of compacted clay, a drainage layer consisting of twelve (12) inches of crushed stone, a geosynthetic filter fabric, and a final vegetative soil cover. A spring was found to run beneath the landfill, so an interceptor trench/water diversion system was placed on the upgradient side of the landfill. This system captures the groundwater and diverts it around the landfill and discharges to a small ditch on the downgradient side of the landfill. A land-use restriction has been proposed to be implemented for this area through completion of an environmental covenant. A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet has also been proposed to be implemented through completion of an environmental covenant. An O&M Plan, to include long-term groundwater monitoring and maintenance of the interceptor trench system, that would be submitted to Ohio EPA for review and acceptance has also been proposed to be completed for this area.

5.3.6 WMU 14 – Small Concrete Tank Testing Pit

Gasoline was reportedly burned in this pit one (1) time to test the flame resistance of fiberglass pipe insulation. Soil samples were collected and analyzed. The direct contact ELCR and HI were found to be below their benchmarks. The protection of groundwater ELCR exceeded the benchmark, due to PCB Aroclor 1248, and the HI exceeded the benchmark, due to naphthalene. Aroclor 1248 and naphthalene had a

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site-wide detection frequency of approximately 2%, while Ohio EPA's *CPRG (2006)* guidance stipulates a detection frequency of at least 5% to initiate remediation. Groundwater is not used as a source for drinking water at the facility, as drinking water is supplied by the City of Granville. As a conservative measure, a site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet has been proposed to be implemented through completion of an environmental covenant.

5.3.7 WMU 15 – Small Former Quarry Excavation About 150 Feet Northeast of Current Paper Incinerator

This area was reportedly used for disposal of waste materials and possibly small tanks or cylinders. Soil samples were collected from the area surrounding the unit. The direct contact ELCR and HI exceeded their benchmarks, due to arsenic. The protection of groundwater ELCR exceeded the benchmark, due to arsenic, and the HI exceeded the benchmark, due to arsenic and thallium. Arsenic and thallium are naturally occurring. Unpaired T Test indicates that the mean thallium concentration is not significantly different from the background mean concentration. Non-parametric Mann-Whitney Test indicated that the median arsenic concentration for soil at WMU 15 is higher than the median background arsenic concentration. Groundwater at the facility is not used as a source of drinking water, as the facility is provided water service from the City of Granville. Groundwater/uppermost saturated zone in the area of this unit is at approximately the 6–8 foot depth. This shallow groundwater would not be expected to produce a quantity of water sufficient for potable use. A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet has been proposed to be implemented through completion of an environmental covenant.

5.3.8 WMU 22 – UST at Building 71

This UST was used for fuel oil storage and did not manage hazardous wastes. This tank has been removed. Documentation of the tank removal activities notes that an odor was present in the excavation pit during the tank removal. Soil samples were collected and analyzed. The direct contact ELCR and HI exceeded their benchmarks, due to arsenic. The protection of groundwater ELCR exceeded the benchmark, due to arsenic, and PCE was found to be within one (1) order of magnitude of the benchmark. The protection of groundwater HI exceeded the benchmark, due to arsenic and chromium. Arsenic and chromium are naturally occurring. Unpaired T Test indicates that the mean arsenic concentration in WMU 22 soil is not significantly different that the mean background concentrations. Unpaired T Test with Welch Correction indicates that the mean chromium concentration is not significantly different from the mean background concentration. Groundwater is not used as a source of drinking water at the facility. The City of Granville provides water services to the facility. As a conservative measure, a site-wide groundwater restriction for use as drinking water to a

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depth of forty (40) feet has been proposed to be implemented through completion of an environmental covenant.

5.3.9 WMU 28 – Septic Tank and Leach Well for Building 75

This unit was a septic tank and leach well that serviced sanitary and non-sanitary waste from Building 75. The unit managed small quantities of hazardous waste. The system was operated from the early 1960s to the mid 1990s. There were no engineered controls in place to prevent a release to soil. Soil samples were collected from around the unit and analyzed. The direct contact ELCR and HI exceeded their benchmarks, due to arsenic. The protection of groundwater ELCR exceeded the benchmark, due to arsenic, and the HI exceeded the benchmark, due to arsenic and chromium. Arsenic and chromium are naturally occurring and chromium VI default values were used in calculations as a conservative measure. Unpaired T Tests with Welch Correction on the In-transformed data indicate that the mean arsenic and chromium concentrations in WMU 28 soil are both significantly higher than the mean background concentrations. However, the potential impact to human health and/or the environment is unlikely based on the facts that no one resides on this portion of the facility, bedrock is encountered prior to a saturated zone sufficient for potable use, and a facility-wide groundwater restriction for use as drinking water to a depth of forty (40) feet will be completed. These facts indicate that the potential pathways would be eliminated and/or extremely limited to any applicable receptors. Therefore, as long as the WMU 28 area remains under the control of Owens Corning (i.e., facility guards, facility fencing, etc.), it has been determined that no additional assessment and/or remediation are necessary. Should Owens Corning ever wish to relinquish oversight/control of the WMU 28 area and/or ever wish to allow someone to reside on the area of the unit, notification to Ohio EPA of Owens Corning's intentions and reassessment of the unit will be necessary at that time. Any reassessment will be limited to identifying what, if any, actions will be needed with respect to the arsenic present in the soil at WMU 28. If Owens Corning wishes to develop the WMU 28 area for commercial or industrial use, Ohio EPA will be notified but Ohio EPA will not require further investigation or remediation of the WMU 28 area. This requirement will be a part of the facility's O&M Plan.

5.3.10 WMU 31 – Fuel Oil USTs

This unit consisted of six (6) fiberglass tanks that were used to store # 2 fuel oil for heating purposes and did not manage hazardous wastes. The tanks were removed in the late 1980s, but no documentation associated with the removal could be found. Soil samples were collected from around the tank cavity area. The direct contact ELCR and HI were below their benchmarks. The protection of groundwater ELCR exceeded the benchmark, due to PCB Aroclor 1248, and the protection of groundwater HI exceeded the benchmark, due to chromium. Chromium is naturally occurring and chromium VI defaults were used as a conservative measure. Unpaired T Test with Welch Correction

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on the In-transformed data indicates that the mean chromium concentration is not significantly different from the background mean concentration. Aroclor 1248 had a site-wide detection frequency of approximately 2%, while Ohio EPA's *CPRG* guidance stipulates a detection frequency of at least 5% to initiate remediation. Groundwater is not used as a source for drinking water at the facility, as drinking water is supplied by the City of Granville. Additionally, Aroclor 1248 was detected in the 0-2 foot sampling interval and the uppermost saturated zone/groundwater was found at the fifty-two (52) foot depth. Aroclor 1248 is not very soluble in water and has a high organic carbon partition coefficient, which would contribute to the limited mobility that would be expected for migration through the soil column to groundwater. As a conservative measure, a site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet has been proposed to be implemented through completion of an environmental covenant.

5.4 Ohio EPA's Evaluations of No Further Action

5.4.1 Site-Wide Surface Water

5.4.1.a. Site-Wide Surface Water (Human Health)

Surface water data evaluated on a site-wide basis were grouped together into a separate, single site-wide surface water data set. The total ELCR was calculated to be $1.26E-5$, which slightly exceeds the benchmark of $1E-5$. No single constituent was found to exceed the benchmark and the main contributor to the risk is known as a common laboratory contaminant. The total HI was calculated to be 9, which exceeds the screening benchmark of 1.0. Thallium was found to be the only constituent with an HI greater than 1.0. Thallium is naturally occurring. The BSL established for thallium was 0.0096 mg/L, while the EPC was calculated to be 0.0098 mg/L. A formal statistical comparison (non-parametric Mann-Whitney Test) of the thallium concentrations in the site-wide surface water data indicated no significant difference between the site-related median surface water concentrations and the background medians. In addition, surface water in the area near the wastewater treatment system is monitored on a monthly basis with the results submitted to the Division of Surface Water for review. Upon review of this data, in conjunction with the site-wide surface water results, all were found to be within applicable regulatory limits. Based on these results and observations, the site-wide surface water does not appear to present significant cancer risks or non-cancer hazards above that attributable to background concentrations. No further action was proposed in regards to human health risk assessment purposes.

5.4.1.b. Site-Wide Surface Water (Ecological)

The site-wide surface water data set was evaluated for applicable risk pathways to ecological receptors. Areas evaluated included site locations where ecologically relevant habitat was present and site activities could potentially have resulted in

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elevated concentrations of constituents. These areas included streams, quarry ponds, and wetlands. Based on the results and observations completed for this ecological assessment, surface water at the facility does not pose any significant ecological risks above that attributable to background concentrations and no further action was proposed in regards to surface water and ecological risk assessment.

5.4.2 Site-Wide Sediment

5.4.2.a. Site-Wide Sediment (Human Health)

The site-wide sediment data were grouped together into a single data set. The total ELCR for site-wide sediment was calculated to be 2E-6, which is below the established benchmark of 1E-5. The total HI was calculated to be 4, which exceeds the screening benchmark of 1.0. The primary contributor to the elevated HI was found to be iron, with some significant elevated contribution also coming from manganese, both of which occur naturally. Previously, Ohio EPA and Owens Corning agreed that iron would be excluded from soil risk calculations due to the facts that it is a human nutrient, occurs naturally, and/or was not known to be prevalent in the waste streams managed at the facility. The fact for the basis of this agreement would also be considered relevant for this specific evaluation and iron was excluded from further calculations. The manganese EPC was calculated to be 740 mg/kg, which is well below the established BSL value of 1,400 mg/kg. Based on these results and observations, the site-wide sediment does not appear to present significant cancer risk or non-cancer hazards above that attributable to background concentrations. No further action was proposed in regards to human health risk assessment purposes.

5.4.2.b. Site-Wide Sediment (Ecological)

The site-wide sediment data set was evaluated for applicable risk pathways to ecological receptors. Areas evaluated included site locations where ecologically relevant habitat was present and site activities could potentially have resulted in elevated concentrations of constituents. Based on analytical results and observations, it was determined that sediment found in the quarry ponds and the associated emergent wetland habitat do not pose a risk to ecological receptors. Potential ecological risks associated with stream sediment and any associated areas (flood plain, wetlands) were limited to two (2) areas of stream habitat: (1) sediment at WMU 27 where there was an elevated lead result; and (2) PCBs identified in stream sediment and flood plain habitat downstream of the wastewater treatment system. Thus, lead and PCBs were identified as chemicals of interest in the SERA and would require that a BERA be completed. The assessment of lead related risks to benthic invertebrates and PCBs to wildlife in stream and flood plain habitat would represent the applicable pathways and receptors necessary to determine if unacceptable risks persist.

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A single elevated detection of lead in sediment measured at WMU 27 in 2002 could not be confirmed in subsequent sampling of the area, and bioavailable lead concentrations measured in 2003 were not high enough to cause adverse effects. Any occurrences of elevated lead concentrations were not sufficiently widespread to affect benthic community structure and function. Based on the PCB analytical results from stream sediment and flood plain habitat, it was determined that PCB concentrations in these areas do not pose a risk of direct toxicity to soil- and sediment-dwelling organisms. In addition to the stream and flood plain habitat analytical results, biota tissue from fishes collected from the streams were analyzed and evaluated for PCBs. Based on all these analytical results, it was determined that PCBs in sediment and biota tissues from the streams and associated flood plain habitat do not pose a risk to wildlife feeding from these areas. The exposures estimated for birds and mammals were found to be well below levels that might cause adverse effects.

Based on the results and observations completed for the SERA and BERA, site-wide sediments from quarry ponds, emergent wetland habitat, flood plains, and/or stream sediments do not appear to present significant cancer risks or non-cancer hazards to the environment. No further action was proposed in regards to ecological risks for the site-wide sediments and associated areas.

5.4.3 WMU 1 – Current <90 Day Container Storage Area

This area was certified clean closed by Ohio EPA in 1994. There have been no documented releases since the clean closure. There are engineered controls in place to prevent a release from reaching the soil. No further action was proposed.

5.4.4 WMU 2 – Suspected Burial Site Consisting of an Outdoor Area Located Between the Current <90 Day Container Storage Area and the Weathering Farm Landfill

This area was characterized with soil and groundwater sampling during the closure activities completed for WMU 1. No evidence of contamination or buried wastes could be found during these investigations. No further action was proposed.

5.4.5 WMU 3 – Area Where Wastes Were Reportedly Stored Along a Treeline Just North of the Current <90 Day Container Storage Area

During closure activities for WMU 1 in 1994, soil samples were collected from this area that confirmed the presence of PCBs. These contaminated soils were appropriately excavated and disposed. Groundwater sampling confirmed that groundwater was not impacted. No further action was proposed.

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5.4.6 WMU 5 – Hazardous Waste Satellite Accumulation Areas

These small areas were located in laboratories and research areas throughout the building complex. Small quantities of hazardous wastes were managed in these areas, which all had engineered controls in place and were inside or under cover. The potential for a release to the environment from these areas is very low. No further action was proposed.

5.4.7 WMU 6 – Non-Hazardous Waste Accumulation Areas

These small areas were located in laboratories and test production areas and consisted of a steel drum with a top fill port. Visual observation found a stain on concrete in an accumulation area outside of Building 61. Soil samples were collected from this area. The ELCRs and HIs for direct contact and protection of groundwater exceeded their benchmarks, all due to arsenic. Arsenic is naturally occurring. The nonparametric Mann-Whitney Test indicated that the median arsenic concentration in soil was not significantly different from the median background arsenic concentration. As the arsenic concentrations in soil at WMU 6 were found to be similar to the naturally occurring levels, there have been no significant impacts to the environment and no further action was proposed.

5.4.8 WMU 10 – Suspected Burial Site Near the Southeast Corner of the Test Homes Landfill

This unit reportedly was used for burial of organophosphate wastes, which are not considered to be hazardous wastes. It is known that organophosphates break down relatively quickly in the environment. *Verschueren (1983)* reports that organophosphates have a 75% to 100% disappearance from soil within one (1) to twelve (12) weeks. This unit is near WMU 9 and upgradient from the groundwater diversion system. Groundwater samples collected from the diversion system and from monitoring wells in the WMU 9 area do not show any indications of organophosphate constituents present. Groundwater in this area has been and will continue to be monitored due to the presence of the landfills in the area. Sampling results indicate there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.9 WMU 11 – Suspected Burial Site Near the Electrical Substation ((a.k.a.) Miscellaneous Burial Site C)

Drummed wastes of unknown content were reportedly buried at this unit which is located on the east side of the Weathering Farm Landfill. Ground penetrating radar did not confirm the presence of buried objects or disturbed material. A radiology survey of the area, which included excavation of test pits, did not identify buried drums. Soil

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samples were collected from this area. The ELCR and HI for direct contact exceeded their benchmark, due to arsenic. The ELCR for protection of groundwater exceeded the benchmark, due to arsenic, and the HI for protection of groundwater exceeded the benchmark, due to arsenic and thallium. Arsenic and thallium are naturally occurring.

The unpaired T Test with Welch Correction indicates that the mean arsenic concentration in WMU 11 soil is not significantly different from the background mean concentration. The unpaired T Test indicates that the mean thallium concentration in WMU 11 soil is not significantly different than the mean background concentration. Groundwater in this area has been and will continue to be monitored due to the presence of the landfills in the area. As the arsenic and thallium concentrations in WMU 11 soil were found to be similar to the naturally occurring levels, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.10 WMU 12 – Former South Quarry Area

Hazardous wastes were reportedly burned, exploded, poured, and/or dispersed onto the ground in this large and open area. Soil, sediment, and surface water samples were collected and analyzed. Soil analyses indicate the ELCR and HI for direct contact exceed their benchmarks, due to arsenic. Soil analyses indicate the ELCR for protection of groundwater exceeds the benchmark, due to arsenic, and the HI for protection of groundwater exceeds the benchmark, due to arsenic and chromium. Arsenic and chromium are naturally occurring and chromium VI default values were used as a conservative measure. The unpaired T Test with Welch Correction indicates that the mean arsenic concentration in WMU 12 soil is not significantly different from the background mean concentration. The non-parametric Mann-Whitney Test indicates that the median chromium concentration in WMU 12 soil is significantly less than the background median concentration. Sediment analyses indicate that the ELCR and HI are less than the established benchmarks. One surface water sample was collected for analysis from the unit. The analytical results from the sample indicate that the ELCR was above the benchmark, due to arsenic, and the HI was above the benchmark, due to arsenic and thallium. Arsenic and thallium are naturally occurring. The surface water results from the site-wide data (including the data from WMUs 7, 12, 21, 30) for arsenic and thallium were compared to the background surface water data. The non-parametric Mann-Whitney Test indicated no significant difference between the site-related median surface water concentrations and the background median concentrations. Soil, sediment, and surface water sampling results indicate there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.11 WMU 13 – Mt. St. Helen's Ash Disposed of in the Southwestern Quarry Ponds

An interim measure was completed at WMU 13 where the Mt. St. Helen's ash was disposed into Pond D. The pond was drained and the containers of Mt. St. Helen's ash

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were removed. Analytical results of the ash indicated it was not a hazardous waste and was similar to naturally occurring soils. The containers holding the ash were relatively intact and the waste ash was appropriately disposed off-site. The pond was allowed to refill and habitat common to the area and pond has re-established. With the completion of this interim action, no further action was proposed for this WMU.

5.4.12 WMU 16 – Old Incinerator which was Located Between the Center and Southern Quarry Ponds on the East Side of the Quarry Road

This unit was used to burn proprietary document paper waste. Soil samples were collected and analyzed from this unit. The direct contact ELCR and HI exceeded the benchmarks, due to arsenic. The protection of groundwater ELCR exceeded the benchmark, due to arsenic, and the protection of groundwater HI exceeded the benchmark, due to arsenic and thallium. The unpaired T Test indicated the mean arsenic concentration in WMU 16 soil is not significantly different from the mean background concentration. The reported maximum thallium concentration (1.9 mg/kg) only slightly exceeded the BSL (1.8 mg/kg) but was less than the maximum detected background concentration (2.5 mg/kg). As the arsenic and thallium concentrations in WMU 16 soil were found to be similar to the naturally occurring levels, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.13 WMU 17 – USTs at Building 11

These USTs were used to store heating and fuel oil and did not manage hazardous waste. These tanks have been removed. There were no documented releases and reportedly there was no evidence of a release when the tanks were removed. As these USTs have been removed and activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.14 WMU 18 – USTs at Building 22

These USTs were used to store fuel oil and did not manage hazardous waste. These tanks have been removed. There were no documented releases and reportedly there was no evidence of a release when the tanks were removed. As these USTs have been removed and activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.15 WMU 19 – UST at Building 53

This UST was used to store fuel oil and did not manage hazardous waste. This tank has been removed. There were no documented releases and reportedly there was no evidence of a release when the tank was removed. As this UST has been removed and

activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.16 WMU 20 – USTs at Building 60

These three (3) USTs contained leaded and/or unleaded gasoline. During tank removals, elevated levels of gasoline associated contaminants were found in the soil. A release was reported to BUSTR and the unit was given incident number #459049. Approximately 264 tons of gasoline-contaminated soils were removed from the unit in 1990. In December 1993, BUSTR issued a No Further Action (NFA) letter for the release incident number for these USTs. The BUSTR NFA letter indicated that the remedial and investigation activities completed for the unit fulfilled BUSTR requirements. Due to the receipt of the BUSTR NFA letter, no further action has been proposed for this unit.

5.4.17 WMU 21 – UST at Building 61

This UST was used to store fuel oil and did not manage hazardous waste. This tank has been removed. There were no documented releases and reportedly there was no evidence of a release when the tank was removed. As this UST has been removed and activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.18 WMU 23 – UST at Building 72

This UST was used to store fuel oil and did not manage hazardous waste. This tank has been removed. There were no documented releases and reportedly there was no evidence of a release when the tank was removed. As this UST has been removed and activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.19 WMU 24 – UST at Building 73

This UST was used to store fuel oil and did not manage hazardous waste. This tank has been removed. There were no documented releases and reportedly there was no evidence of a release when the tank was removed. As this UST has been removed and activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.20 WMU 25 – UST at Building 75

This UST was used to store fuel oil and did not manage hazardous waste. This tank has been removed. There were no documented releases and reportedly there was no

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evidence of a release when the tank was removed. As this UST has been removed and activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.21 WMU 26 – Current Paper Incinerator

The incinerator is used to burn paper only and has not managed hazardous wastes. It is gas powered. Operations began in 1988 and continue to date. Five (5) soil samples were collected from the shallow soils at the unit. The direct contact ELCR and HI exceeded their benchmarks, due to arsenic. The protection of groundwater ELCR exceeded the benchmark, due to arsenic, and the HI exceeded the benchmark, due to arsenic and thallium. Arsenic and thallium are naturally occurring. The unpaired T Test indicates that the mean arsenic concentration in WMU 26 soils is not significantly different from the mean background concentration. Unpaired T Test with Welch Correction indicates that the mean thallium concentration in WMU 26 soil is not significantly different from the mean background concentration. As the arsenic and thallium concentrations in WMU 26 soil were found to be similar to the naturally occurring levels, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.22 WMU 27 – Building 20 to 22 Complex - Former Neutralization Basin to Include the Basin, Lines, and Ravine

This neutralization basin consisted of a concrete pit with a gravel floor. It was used to collect non-sanitary water from sinks and floor drains in the nearby building complex prior to discharge to the ravine/creek. It was operated from the late 1970s to mid 1980s. Hazardous wastes were likely placed into these drains and no engineered controls were in place to prevent a release to the area. Soil, sediment, and surface water samples were collected and analyzed. The soil direct contact and protection of groundwater ELCRs and HIs were all below their established benchmarks. The surface water ELCR and HI were below their established benchmarks. The sediment ELCR exceeded the benchmark, due to arsenic, and benzo(a)pyrene was within one (1) order of magnitude of the benchmark. The sediment HI exceeded the benchmark, due to arsenic. Arsenic is naturally occurring. The nonparametric Mann-Whitney Test indicates that median arsenic concentration is not significantly different from the median background concentration. The unpaired T Test indicates that the mean arsenic concentration is not significantly different from the mean background concentration. Since the data set was so small (2 samples), WMU 27 surface water data was combined with the site-wide data, including data from WMUs 7, 12, and 30, and compared to the background data. The nonparametric Mann-Whitney Test indicates that the combined data set median arsenic concentration is not significantly different from the median background concentration. As the arsenic concentration in WMU 27

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soil was found to be similar to the naturally occurring levels, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.23 WMU 29 – Septic Tank and Leach Well for Building 76

This septic tank and leach well serviced sanitary and non-sanitary waste from Building 76. This unit managed small quantities of hazardous waste. There were no engineered controls in place to prevent a release to the soil. Soil samples were collected from around the unit and analyzed. The direct contact and protection of groundwater ELCRs and HIs exceeded their benchmarks, all due to arsenic. Arsenic is naturally occurring. The unpaired T Test with Welch Correction on the ln-transformed data indicates that the mean arsenic concentration is not significantly different from the background mean concentration. As the arsenic concentration in WMU 29 soil was found to be similar to the naturally occurring levels, there have been no significant impacts to the environment and no further action was proposed for this unit.

5.4.24 WMU 30 – Ravine East of Building 75 Where the Drain Line from this Building Formerly Discharged

This unit includes the ravine east of Building 75 where a terra cotta drain line from Building 75 formerly discharged. Small quantities of hazardous wastes were likely discharged through the drain line. The drain serviced the mechanical room and the cooling tower from the early 1960s. Use of this drain line stopped when the mechanical room ceased operations and the cooling tower was removed, but the actual dates were not known. Engineered controls were not in place to prevent releases from occurring. Soil, sediment, and surface water samples were collected and sent for analyses. The soil direct contact and protection of groundwater ELCRs and HIs are below their benchmarks. The sediment ELCR and HI are below their benchmark. The surface water ELCR and HI are below their benchmark. As a release to soil, sediment, and surface water has not occurred and there are no significant impacts to the environment, no further action was proposed for this unit.

5.4.25 WMU 32 – USTs at the Former Granville Aggregates Building

These USTs were used to store diesel fuel and gasoline and did not manage hazardous wastes. The tanks were removed, with activities documented, and reportedly no evidence of a release was detected during the tank removals. As these USTs have been appropriately removed and activities documented, there have been no significant impacts to the environment and no further action was proposed for this unit.

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5.4.26 AOC 1 – Former Tank Testing Area

This unit was a pit used to perform tank tightness testing on plastic/fiberglass tanks. The pit was also used to test the burn characteristics of tanks. Naphthalene was used one (1) time for burning test materials on a concrete pad at the unit. The unit was operational from the mid 1960s to the late 1980s. The pit has been filled with soil. Soil samples were collected and analyzed. The direct contact ELCR and HI, and the protection of groundwater ELCR, were all below their benchmarks. The protection of groundwater HI exceeded the benchmark, due to thallium. Thallium is naturally occurring. Thallium was detected at a maximum concentration of 2.1 mg/kg, which is slightly above the BSL of 1.8 mg/kg, but is below the maximum detected background concentration of 2.5 mg/kg. The unpaired T Test indicates that the mean thallium concentration in AOC 1 soil is not significantly different from the mean background concentration. The nonparametric Mann-Whitney Test indicates that the median thallium concentration is not significantly different from the median background concentration. Based on these results and observations, a release to soil has not occurred, there have been no significant impacts to the environment, and no further action was proposed for this unit.

6.0 SUMMARY OF OHIO EPA'S PREFERRED REMEDIES

Based on Ohio EPA's evaluation of the existing and proposed remedies, including the no further action proposals, described above and summarized below, Ohio EPA is proposing to select those remedies as the preferred remedies for the Owens Corning facility.

A final supplemental RFI Report was submitted to Ohio EPA on October 17, 2007 for review and approval. This report was revised on March 17, 2008. The report summarized the results of all sampling and screening risk analyses. The RFI results were compared to all applicable state and/or federal regulatory standards, human health and ecological risk pathways, and any associated receptors in regards to soil, sediment, surface water, and groundwater for individual unit and/or site-wide assessments. The report also proposed potential remedies and future courses of action for all WMUs/AOCs and site-wide evaluations.

Ohio EPA has reviewed the RFI Report and has made a preliminary conclusion that the following remedies are appropriate as final remedies. These remedies are believed to be protective of human health and the environment; meet applicable media cleanup standards; control the source of releases to reduce or eliminate further releases that may pose a threat to human health and the environment; comply with applicable standards for management of waste; will be reliable and effective over the long term; can be easily implemented; and will be cost effective. These remedies are as follows:

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- **Site-Wide Groundwater Use Restriction** – A site-wide groundwater restriction for use as drinking water to a depth of forty (40) feet below ground surface will be implemented through completion of an environmental covenant. This use restriction will cover all the property at the facility currently owned and managed by Owens Corning. Currently, groundwater from this upper saturated zone is not used for drinking purposes at the facility. This drinking water use restriction was necessary due to elevated ELCRs and HIs based on site-wide ground water concentrations for the residential drinking water scenario and based on soil concentrations for protection of groundwater, specifically at WMUs 4, 7, 8, 9, 14, 15, 22, 28, and 31. The primary major contributor to the elevated risk values was predominately arsenic. Arsenic, although naturally occurring, was also a potential product used at the facility. Elevated ELCRs and HIs for the protection of groundwater indicate only the potential for constituents in soils to leach/migrate into groundwater. Thus, the site-wide groundwater restriction for use as drinking water in the upper forty (40) feet of soil was necessary to assure protection of human health and the environment over the long term. The facility is serviced with drinking water provided by the Village of Granville's municipal water supply. The environmental covenant runs with the land and is binding to the property owner, whoever that may be. This drinking water use restriction, in conjunction with the land use restriction and O&M Plan, will eliminate or extremely limit any potential risk associated exposure pathways for any applicable receptors now and in the future.
- **Land Use Restrictions** – Land use restrictions will be implemented through completion of an environmental covenant(s). The areas surrounding the waste water treatment system (WMU 7) and the two (2) on-site landfills (WMUs 8 and 9) will be restricted from residential and/or public access now and in the future, or until the time Ohio EPA would accept a clean closure proposal for a specified WMU. The environmental covenant(s) runs with the land and is binding to the property owner, whoever that may be. Besides the land use restriction, Owens Corning also relies on other means of restricting access to these areas by fencing at the units, patrols/guards on duty, and fencing and/or limited access to the entire facility property. With implementation and maintenance of this use restriction, in addition to the other means of access restriction employed by Owens Corning, any potential risk associated exposure pathways will be eliminated or extremely limited for any applicable receptors now and in the future.
- **Operations and Maintenance Plan** – An O&M Plan will be completed and submitted to Ohio EPA for review and acceptance. The plan will include long-term groundwater monitoring in the areas near WMUs 7, 8, and 9, as well as monitoring the groundwater coming onto the site and leaving the site. The plan will also include the mechanisms for maintaining the integrity of the wastewater treatment system, each of the two (2) on-site landfills, and the groundwater

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interceptor system between WMUs 8 and 9 now and in the future. Periodic documentation of current land use(s), as identified in the environmental covenants, will also be completed. Periodic documentation regarding Owens Corning's control of and/or current land use of the WMU 28 area will be completed. Should Owens Corning ever wish to relinquish control of and/or allow someone to reside on the WMU 28 area, notification to Ohio EPA of Owens Corning's intentions and reassessment of the unit for the identified will be completed at this time. Any reassessment will be limited to identifying what, if any, actions will be needed with respect to arsenic in the soil at WMU 28. If Owens Corning wishes to develop the WMU 28 area for commercial or industrial use, Ohio EPA must be notified, but Ohio EPA will not require further investigation or remediation of the WMU 28 area. With implementation and management of the O&M Plan, in conjunction with the stipulations of the environmental covenants, human health and the environment will be protected currently and over the long term.

- **Removal of Mt. St. Helen's Ash** – Drums of Mt. St. Helen's Ash were removed from Pond D and/or WMU 13. The pond was drained and the containers of Mt. St. Helen's ash were removed. After removal, analytical results of the ash indicated it was not a hazardous waste and in fact was similar to naturally occurring soils. The containers holding the ash were relatively intact and the waste ash was appropriately disposed off-site. The pond was allowed to refill and habitat common to the area and pond has re-established. With the completion of this interim action, all potential risk pathways were eliminated for the long term for all receptors, the media was removed and appropriately disposed off-site, and it was determined that no further action is needed at this WMU.

Upon Ohio EPA's approval of the RFI Report, issuance of a final decision, and response to any public comments, Owens Corning will be required to implement the specified remedies. It has been determined that a CMS is not necessary for this project.

7.0 GLOSSARY OF TERMS

Area of Concern (AOC)	Any location at the facility under the control or ownership of the owner or operator where a release to the environment of hazardous waste(s) or hazardous constituents has occurred, is suspected to have occurred, or may occur, regardless of the frequency or duration of the release.
Background Screening Level (BSL)	Concentration of naturally occurring constituents in the environment that would exist even in the absence of the industrial site under consideration. These concentrations do not necessarily represent cleanup concentrations.
Benchmark	The screening risk values established to determine if further action(s) are needed at a WMU/AOC.
Corrective Measures Study (CMS)	A study undertaken by a facility whose purpose is to develop and evaluate remedial alternatives for the cleanup of environmental contaminants at a facility.
Decision Document	A document issued by the Ohio Environmental Protection Agency that identifies the Director's selected remedy or remedies for a contaminated site and the reasons for its selection.
Environmental Covenant	A legal agreement that requires appropriate restrictions on land and/or natural resource use on the property to protect human health and the environment and to prevent conditions on the property from constituting or threatening to cause or contribute to air or water pollution or soil contamination.
Excess Lifetime Cancer Risk (ELCR)	An estimate of the potential increased risk of cancer that results from lifetime exposure, at specified average daily doses, to constituents detected in media at the site.
Exposure Pathway	Route by which a contaminant is transported from the site to a human or ecological receptor.
Hazard Index (HI)	The sum of hazard quotients (non-cancer) for all exposure routes relevant to that constituent. Indicates if the estimated exposure dose for that constituent exceeds acceptable levels for protection against non-cancer effects.

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Interim Measure	A near term stabilization tool used to slow or stop contamination migration, thereby reducing risk to human health and the environment.
Operations and Maintenance (O&M)	Long-term measures taken at a site, after the initial remedial actions, to assure that a remedy remains protective of human health and the environment.
Resource Conservation and Recovery Act (RCRA)	A federal law that regulates the generation, transport, storage, treatment and disposal of hazardous wastes.
RCRA Facility Investigation (RFI)	A study conducted to collect information necessary to adequately characterize a site for the purpose of developing and evaluating effective remedial alternatives.
Responsiveness Summary	A summary of all comments received from the public on the Statement of Basis and RCRA Facility Investigation Report and Ohio EPA's response to those comments
Screening Risk Assessment	A preliminary study that evaluates the possible potential health risks to people and the environment from exposure to contaminated media.
Risk Clean Number (RCN)	A risk-based clean level for a specific chemical, developed with generic default values in the same equations used to calculate risk, that when used appropriately can be substituted for a site-specific risk assessment to meet the applicable performance standards.
Semi-Volatile Organic Compound (SVOC)	Carbon based compounds that do not evaporate very fast at room temperature.
Volatile Organic Compound (VOC)	Carbon based compounds which evaporate quickly at room temperature (e.g., solvents).
Waste Management Unit (WMU)	Any discernable unit at which wastes have been placed at any time irrespective of whether the unit was intended for the management of solid or hazardous waste; such units include any area at the facility where solid wastes have been routinely and systematically released.