



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 7**

11201 Renner Boulevard  
Lenexa, Kansas 66219

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Article Number: 7013 3020 0001 1645 8328

Mr. Curt Gardner  
EHS Manager  
BASF  
Agricultural Division  
3150 Highway JJ  
Palmyra, Missouri 63461-2611

RE: Final Remedy Decision and Response to Comments  
BASF Corporation, Palmyra, Missouri  
EPA ID# MOD050226075

Dear Mr. Gardner:

The U.S. Environmental Protection Agency Region 7 has decided to issue a Final Decision regarding the proposed remedies in the Statement of Basis. This letter includes a Schedule of Compliance for submittal of documents related to implementation of the Final Remedy. Attached is the Final Decision document and associated Response to Comments.

Schedule of Compliance:

1. Within 45 days of receipt of this letter BASF shall submit a document containing institutional controls following the Missouri Environmental Covenants Act to prevent unacceptable exposures to soil and groundwater during the lifetime of the remedy.
2. Within 45 days of receipt of this letter BASF shall submit the Soil Excavation Management Plan (SEMP) and include a reference requiring compliance with the SEMP during the lifetime of the remedy.
3. Within 45 days of receipt of this letter BASF shall submit the Safety Work Permit Program (SWPP) document and include a reference requiring compliance with the SWPP during the lifetime of the remedy.
4. Within 30 days of approval of the EC, SEMP and SWPP BASF shall file a copy of the EC in the chain of title for the facility property. Documentation that the EC was filed shall be forwarded to the EPA and the Missouri Department of Natural Resources within 15 days of filing.



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5. Within 30 days of receipt of this letter BASF shall submit a detailed and updated cost estimate for implementation of the final remedy as proposed in the Corrective Measures Study document dated October 13, 2011.
6. Within 30 days of approval of the updated cost estimate BASF shall submit financial assurance documents in accordance with 40 CFR Part 264.145.

BASF shall submit two copies of all documents (one hard copy and one electronic), to Mike Dandurand, P.E., Environmental Engineer, U.S. Environmental Protection Agency Region 7, AWMD/WRAP, 11201 Renner Boulevard, Lenexa, Kansas 66219 and three copies to Mr. Richard Nussbaum, P.E., R.G., Chief Permits Section, Hazardous Waste Program, P.O. Box 176, Jefferson City, Missouri 65102-0176. If you have any questions regarding this letter, you may contact me at (913) 551-7504 or by email at [dandurand.michael@epa.gov](mailto:dandurand.michael@epa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Dandurand', with a stylized flourish at the end.

Mike Dandurand, P.E.  
Environmental Engineer  
Waste Remediation and Permitting Branch  
Air and Waste Management Division

Enclosures

cc: Nathan Kraus, MDNR

**U.S. Environmental Protection Agency  
Final Decision and Response to Comments  
BASF Corporation – Hannibal Plant  
Palmyra, Missouri  
EPA ID # MOD 050226075**

**INTRODUCTION**

This Final Decision and Response to Comments is being presented by the U.S. Environmental Protection Agency. The purpose of the FD/RTC is to present issues and concerns raised during the public comment period on the remedy proposed for the BASF Corporation – Hannibal Plant in Palmyra, Missouri, to provide responses to those issues and concerns, and to identify the remedy that the EPA has selected for the site. Minor comments were received by the EPA during the public comment period. Responses to the comments are included in this FD/RTC and modifications to the originally proposed remedy have been made as a result.

**LOCATION**

BASF is located at 3150 Highway JJ, Palmyra, Missouri in Marion County. The BASF property occupies approximately 1,800 acres located in Sections 10, 11, 14, 15, 22 and 23 Township 3 South, Range 5 West and at latitude 91°27'45" longitude 39°51'10", of which approximately 250 acres is subject to corrective action. The Site is bounded by surface waters to the northwest (South River), the north (Mississippi River), the west (North River), and to the east and southeast (Rock Ridge Slough and the Bay de Charles).

**FACILITY HISTORY**

BASF was issued a Part 2 Hazardous and Solid Waste Amendments Permit (Permit), effective date of May 30, 1990, by the EPA and a Part 1 Missouri Hazardous Waste Management Facility Permit, effective date of April 25, 1990, for the operation of a hazardous waste treatment and storage facility. BASF was formerly known as American Cyanamid Company.

The American Cyanamid Company, now known as Wyeth Holding LLC (a wholly-owned subsidiary of Pfizer Inc.), purchased the property in 1965. Prior to 1965, the property was used for agricultural purposes. In 1965, the ammonia storage and loading facility, ammonium nitrate production facility and a nitric acid production facility were constructed. Another nitric acid production facility was constructed in 1978. In 1971, the di-calcium phosphate production facility and 12 acres in the north-central portion of the facility were leased to Alpharma who manufactured animal feed intermediates. Alpharma's manufacturing operations at the AFI Plant were discontinued in 2003. The insecticide production area was constructed in 1977. In 1978 and 1979, the herbicide plant area was constructed after an explosion destroyed the original herbicide plant in 1977. The facility currently manufactures agricultural chemicals including herbicides and insecticides.

BASF purchased the facility on July 1, 2000, and is the current owner and operator; however, Wyeth Holdings LLC retains financial responsibility for certain historical environmental matters.

## **SELECTED REMEDY**

The corrective action remedy to address contaminated groundwater and soils at the BASF facility is:

### **Site Groundwater Contamination**

- Operate the current IM pump and treat system that incorporates air stripping technology to remove pollutants from groundwater and to control groundwater migration.
- Implement monitored natural attenuation that uses natural degradation processes to reduce contaminant mass.
- Utilize groundwater monitoring wells to document contaminant plume containment and reduction in contaminant concentrations.
- Submit annual progress reports in accordance with Permit conditions.
- Establish institutional controls following the Missouri Environmental Covenants Act to prevent unacceptable exposures during the lifetime of the remedy.

### **Site Soil Contamination**

- Engineering controls to limit exposure to soil using existing buildings, piping and operational infrastructure.
- Establish work practice controls in the form of a Soil Excavation Management Plan and a Safety Work Permit Program to minimize exposure.
- Establish institutional controls following the Missouri Environmental Covenants Act to prevent unacceptable exposures during the lifetime of the remedy.

Based upon a comparison to the general standards and selection decision factors, the EPA determined that the proposed remedies for the site represented the best balance of environmental protectiveness, effectiveness, implementability and cost. Therefore, the corrective measures listed above were selected as the final remedy.

## **REMEDIAL ACTION OBJECTIVES**

The Remedial Action Objectives selected for this site represent the EPA's Regional Screening Levels for Industrial Soils and Maximum Contaminant Levels for groundwater. The RAOs were selected based on an evaluation of current site conditions, future expected site conditions and a letter from BASF to the EPA, dated July 23, 2014, referencing land use scenarios and the use of an environmental covenant. RSLs are risk-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are considered by the EPA to be protective for human health (including sensitive groups) over a lifetime. A table containing the current RSLs has been included in the Administrative Record. Drinking water standards MCLs have been established as the final cleanup goal for groundwater at the site.

MCLs are periodically revised and may be reviewed in the document entitled 2012 Edition of the Drinking Water Standards and Health Advisories, dated April 2012 (a copy has been included in the Administrative Record).

If a contaminant present in groundwater does not have a final MCL an EPA RSL for tap water is used.

Tables 1 and 2 below provide the cleanup goals for soil and groundwater; however, it is not expected that on-site groundwater would be used for potable water supply.

**Table 1: Remedial Action Objectives for Soil**

<b>Compound</b>	<b>RAO</b>	<b>Source of RAO</b>
Chlorobenzene (MCB)	1,300 mg/kg	RSL – Industrial Soil
1,2-Dichloroethane	2.0 mg/kg	RSL – Industrial Soil
Vinyl Chloride	1.7 mg/kg	RSL – Industrial Soil
Naphthalene	17 mg/kg	RSL – Industrial Soil
Toluene	47,000 mg/kg	RSL – Industrial Soil

RAO Remedial Action Objective

mg/kg milligrams per kilogram

RSL The EPA Regional Screening Levels for Industrial Soils (May 2014)

**Table 2: Remedial Action Objectives for Groundwater**

<b>Compound</b>	<b>RAO</b>	<b>Source of RAO</b>
Chlorobenzene (MCB)	0.1 mg/L	MCL
1,2-Dichloroethane	0.005 mg/L	MCL
Vinyl Chloride	0.002 mg/L	MCL
Naphthalene	0.00017 mg/L	RSL – tap water
Toluene	1.0 mg/L	MCL

RAO Remedial Action Objective

mg/l milligrams per liter

MCL The EPA Maximum Contaminant Level for EPA’s Safe Drinking Water Act Regulations and Health Advisories

RSL The EPA Regional Screening Levels for tap water (May 2014)

**PUBLIC PARTICIPATION ACTIVITIES**

A public comment period was held from August 27, 2014, to September 26, 2014. No public hearings were requested or held. Supporting documents were provided in the administrative record and were available for review during the comment period. Minor comments were received during the public comment period. The comments and responses are presented below. Changes were made based on the comments.

**PUBLIC COMMENTS AND EPA RESPONSE**

1. Page 1 – Under “Facility Description and History”, third paragraph:  
Change “Wyeth Holding Corporation (and currently owned by Pfizer)” to “Wyeth Holdings LLC (a wholly-owned subsidiary of Pfizer Inc.)

**EPA Response:** The EPA acknowledges the comment and has made appropriate changes.

2. Page 1 – Under “Facility Description and History”, last paragraph:  
Change “Wyeth Holding Corporation (Pfizer)” to “Wyeth Holdings LLC.”

**EPA Response:** The EPA acknowledges the comment and agrees with the language as proposed. The section in question is not included in the FD/RTC.

3. Page 2 – Fourth complete paragraph:  
Change “Arcadis” to “Wyeth Holdings LLC”.

**EPA Response:** The EPA acknowledges the comment and agrees with the language as proposed. The section in question is not included in the FD/RTC.

4. Page 3 – Reference to Figure 1: It is difficult to determine the locations of several source areas and borings described in Table 1.

**EPA Response:** The EPA attached scanned figures that were obtained from the Corrective Measures Study submitted by Arcadis on behalf of Wyeth Holdings LLC. The EPA does not have the capacity to modify maps, figures and tables presented in the CMS. Please refer to the CMS for the complete maps, figures and tables.

5. Page 3 – Table 1, “Soil Source Areas and Constituents of Concern”: Boring DP-30 is referenced in Table 1, but is not shown on Figure 1.

**EPA Response:** Boring DP-30 is in the vicinity of SCB-101 shown on Figure 1 of the Statement of Basis. Boring DP-30 is identified on Figure 7.3 of the CMS. The EPA does not have the capacity to modify maps, figures and tables presented in the CMS. Please refer to the CMS for the complete maps, figures and tables.

6. Page 4 – Under “Proposed Remedy, Site Groundwater Contamination”: No mention is made of a MoECA [Missouri Environmental Covenants Act] for groundwater. The implementation of institutional controls is an important component of the groundwater corrective action and should include: 1) filing a notice in environmental and real estate records, detailing the restriction of the permit or order; 2) implementing the provisions of the Missouri Environmental Covenants Acts; and 3) recording the restriction at the local county recorder’s office.

**EPA Response:** The EPA acknowledges this as an oversight. The statement “Establish institutional controls following the Missouri Environmental Covenants Act to prevent unacceptable exposures during the lifetime of the remedy” has been added to the Selected Remedy, Site Groundwater Contamination.

7. Page 4 –Under “Proposed Remedy, Site Soil Contamination”, fourth bullet: Consider the phrase “may, as needed” to replace the word “will” in this sentence. Any impacted soil may be potentially be treated in-place, as appropriate, rather than removed.

**EPA Response:** The EPA acknowledges this comment. The fourth bullet has been revised to “Establish institutional controls following the Missouri Environmental Covenants Act to prevent unacceptable exposures during the lifetime of the remedy” in the Selected Remedy, Site Soil Contamination.

8. Page 4 –Table 3, Remedial Action Objectives for Soil: Since the RCRA Facility Investigations or Table 1 of the Statement of Basis did not identify toluene as a constituent of concern, it is unclear as to why a remedial action objective for toluene is listed.

**EPA Response:** A release of toluene from the IMI-1 plant at the facility has resulted in impacts to environmental media at the facility. Corrective action including excavation of toluene impacted soils is currently occurring at the facility. Toluene was not identified as a constituent of concern at the time of the RFI, but is subject to RCRA cleanup authority and will remain on the list of Remedial Action Objectives.

9. Page 4 –Table 3, Remedial Action Objectives for Groundwater: Since the RCRA Facility Investigations or Table 2 of the Statement of Basis did not identify naphthalene or toluene as a constituent of concern, it is unclear as to why a remedial action objective for naphthalene or toluene is listed.

**EPA Response:** Naphthalene was listed as a possible constituent of concern in the CMS based on a potential soil source area. Naphthalene was included in the event there is unidentified soil contamination beneath one of the buildings or in another area of the facility that may contribute to groundwater contamination in the future. Naphthalene will remain on the list of Remedial Action Objectives.

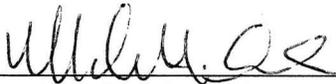
A release of toluene from the IMI-1 plant at the facility has resulted in impacts to environmental media at the facility. Corrective action including excavation of toluene impacted soils is currently occurring at the facility. Toluene was not identified as a constituent of concern at the time of the RFI, but is subject to RCRA cleanup authority and will remain on the list of Remedial Action Objectives.

10. Page 6 –under EVALUATION OF PROPOSED REMEDY, subheading “Attain Media Cleanup Standards”: Consider adding the phrase “and/or treated” following “removed” in the first sentence. Any impacted soil may also potentially be treated in-place, as appropriate, rather than removed.

**EPA Response:** The EPA acknowledges this comment and agrees with the language as proposed. The section in question is not included in the FD/RTC.

## **DECLARATIONS**

Based on the administrative record compiled for these corrective actions, I have determined that the selected remedies to be ordered at this site are appropriate and will be protective of human health and the environment.

  
\_\_\_\_\_  
Mark A. Smith, Acting Director  
Air and Waste Management Division

9/30/14  
\_\_\_\_\_  
Date