

ADEM



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301463 36130-1463 ♦ 1400 COLISEUM BLVD. 36110-2059

MONTGOMERY, ALABAMA

WWW.ADEM.STATE.AL.US
(334) 271-7700

JAMES W. WARR
DIRECTOR

September 10, 2003

BOB RILEY
GOVERNOR

CERTIFIED MAIL # 7003 0500 0001 2706 8083
RETURN RECEIPT REQUESTED

Robert A. Paschke, Environmental Engineering Manager
3M Company - Decatur
3M Environmental Technology and Safety Services
P.O. Box 33331
St. Paul, MN 55133-3331

Facsimiles: (334)
Administration: 271-7950
General Counsel: 394-4332
Air: 279-3044
Land: 279-3050
Water: 279-3051
Groundwater: 270-5631
Field Operations: 272-8131
Laboratory: 277-6718
Mining: 394-4326
Education/Outreach: 394-4383

RE: Environmental Indicator Evaluations
3M Company
U.S. EPA I. D. No. ALD 004 023 164

Dear Mr. Paschke:

The Alabama Department of Environmental Management (ADEM) has recently completed a qualitative evaluation of the environmental conditions at the 3M Company (3M) site, in Decatur, Alabama. ADEM is pleased to provide you with a copy of the evaluation for your information.

While implementing the permitting requirements of the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) and the Resource Conservation and Recovery Act (RCRA), as amended by the 1984 Hazardous and Solid Waste Amendments (HSWA), at the 3M Decatur site, ADEM is always cognizant of its role in protecting human health and limiting further migration of groundwater contamination. As such, the enclosed evaluation covers two specific issues regarding environmental contamination applicable to the facility and local community:

- 1) Plausible human exposure to soil, groundwater, air and surface water contamination at or from the facility, and;
- 2) The continuing migration of contaminated groundwater, both on-site and off-site.

Please note that the purpose of the environmental indicator evaluation is solely to evaluate the status of the two environmental indicators discussed, and that it does not reduce or limit in any way the facility's obligation to perform any monitoring, maintenance, investigation, remediation, or other activity required pursuant to any applicable regulations, permits, or orders.

The enclosed environmental indicator evaluation should not be viewed as somehow separate and distinct from the corrective action activities taken at the 3M Decatur site. Rather, it is an evaluation of current environmental conditions and a focusing of efforts on potential concerns that ADEM, the facility and interested members of the public must work toward satisfying through implementation of the corrective action process at the 3M Decatur site. Therefore, every evaluation should conclude with a projection or outline of future actions to move the facility toward the point where human exposures and/or groundwater releases are controlled. It should be understood that the evaluations operate at the "facility level." In other words, **every area** at the facility must meet the control definition before human exposures or groundwater releases can be considered controlled.

Birmingham Branch
110 Vulcan Road
Birmingham, Alabama 35209-4702
(205) 942-6168
(205) 941-1603 (Fax)

Decatur Branch
2715 Sandlin Road, S.W.
Decatur, Alabama 35603-1333
(256) 353-1713
(256) 340-9359 (Fax)

Mobile Branch
2204 Perimeter Road
Mobile, Alabama 36615-1131
(251) 450-3400
(251) 479-2593 (Fax)

Mobile - Coastal
4171 Commanders Drive
Mobile, Alabama 36615-1421
(251) 432-6533
(251) 432-6598 (Fax)



Printed on Recycled Paper

Robert A. Paschke
September 10, 2003
Page 2

Because many different corrective action documents frequently exist at a facility, ADEM has tried to select the most pertinent documents from which to make its evaluation. The utilized source documents, the Description of Current Conditions (DCC) Report dated February 1998 and the RCRA Facility Investigation (RFI) Report dated August 2003 are explicitly referenced in the evaluation to provide clarity and reproducibility. ADEM recognizes that the potential exists for current conditions at the facility to be somewhat different to that represented in the evaluation. Such discrepancies can be administratively managed during implementation of the ongoing corrective action process and subsequent re-evaluations.

In summary, the evaluation represents a "snap-shot" of the facility's environmental conditions at a particular point in time, and it is a dynamic document subject to revision. Because of the evaluation's focus on current environmental conditions, ADEM views the evaluation as an excellent resource for members of the public as well as the facility. ADEM hopes you find the evaluation useful and informative.

If questions or comments arise regarding this evaluation, please contact Mr. Brian C. Espy of my staff at (334) 271-7749.

Sincerely,



Phillip D. Davis, Chief
Industrial Hazardous Waste Branch
Land Division

PDD/BCE/set:Z: 3M_EI Memo, Sep 2003.doc

Encl.: Environmental Indicator Memo

cc: Lindsey Agricola, ADEM, w/attachments
Jaisimha Kesari, Weston Solutions, w/attachments
Narindar Kumar, USEPA R4, w/attachments

File: 3M Company / Morgan



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301463 36130-1463 ♦ 1400 COLISEUM BLVD. 36110-2059

MONTGOMERY, ALABAMA

WWW.ADEM.STATE.AL.US

(334) 271-7700

JAMES W. WARR
DIRECTOR

September 10, 2003

BOB RILEY
GOVERNOR

MEMORANDUM

TO: Phillip D. Davis, Chief *PD*
Industrial Hazardous Waste Branch
Land Division

THROUGH: Vernon H. Crockett, Chief *VH*
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

FROM: Brian C. Espy *BCE*
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

RE: Evaluation of status under the RCRAInfo Corrective Action Environmental Indicator Event Codes (CA725 and CA750) for the 3M facility in Decatur, Morgan County, Alabama
USEPA Identification Number ALD 004 023 164

Facsimiles: (334)
Administration: 271-7950
General Counsel: 394-4332
Air: 279-3044
Land: 279-3050
Water: 279-3051
Groundwater: 270-5631
Field Operations: 272-8131
Laboratory: 277-6718
Mining: 394-4326
Education/Outreach: 394-4383

I. PURPOSE OF MEMO

This memo is written to formalize an evaluation of the status of 3M, in relation to the following corrective action event codes defined in the RCRAInfo database:

- 1) Current Human Exposures Under Control (CA725),
- 2) Migration of Contaminated Groundwater Under Control (CA750).

Concurrence by the Industrial Hazardous Waste Branch Chief is required prior to entering these event codes into RCRAInfo. Your concurrence with the interpretations provided in the following paragraphs and the subsequent recommendations is satisfied by dating and signing at the appropriate locations within Attachments 1 and 2.

II. HISTORY OF ENVIRONMENTAL INDICATOR EVALUATIONS AT THE FACILITY AND REFERENCE DOCUMENTS

This particular evaluation is the second evaluation performed by the Alabama Department of Environmental Management (ADEM or the Department) for the 3M Company Decatur facility. A previous evaluation was completed by ADEM, dated June 28, 2000. The evaluation, and associated interpretations and conclusions on contamination, exposures and contaminant migration at the facility are based on information obtained from the following documents:

- Description of Current Conditions (DCC) Report dated February 1998
- RCRA Facility Investigation (RFI) Report dated August 2003



III. FACILITY SUMMARY

The 3M Company (3M) owns and operates a major specialty chemical and polymer film manufacturing facility approximately 4 miles west of downtown Decatur, Alabama. The site occupies approximately 900 acres at latitude 34°38'30" N and longitude 87°02'30" W. The site is bordered by Alabama Highway 20 to the south, Finley Island Road to the west, the Tennessee River to the north, and State Docks Road to the east. The surrounding land use is predominantly industrial and commercial except for the river, which has industrial and recreational uses. Prior to the plant's construction, the area consisted primarily of agricultural and residential properties.

The 3M facility was constructed in 1960 and began manufacturing operations in 1961. The facility consists of two plants, the Film Plant and the Chemical Plant. The Chemical Plant produces specialty chemicals that are used in the home furnishings, food packaging, electronics, automotive, and fire-fighting industries. The Film Plant was not part of the plant until its expansion in 1962, and produces polyester-based films and resins that are used to manufacture products used in video and data recording, food packaging, traffic control, and packaging tape industries.

In December 1993, a draft RCRA Facility Assessment (RFA) was completed by EPA's contractor, A.T. Kearney, Inc. and submitted to EPA Region IV. In August of 1994, 3M submitted to EPA and the Department a technical response to the draft RFA. In March 1996, during EPA's and the Department's review of 3M's response to the draft RFA, 3M and the Department entered into a Consent Order (No. 96-059-CHW) that requires 3M to undertake corrective action for Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) located at the site. In December 1997, the Department and EPA Region IV approved a final RFA. In order to fulfill their first requirement of the Consent Order, 3M submitted the Description of Current Conditions (DCC) Report in March 1998. The Department approved the DCC Report in January 1999. The second requirement of the Consent Order was fulfilled when 3M submitted an RFI Work Plan to the Department in January 2001. The RFI Work Plan was approved in April 2001. In accordance with the RFI Work Plan, field investigations commenced in May 2001. In January 2002, the Department and 3M met at the Department's central office in Montgomery, AL for an update of activities. During the meeting, 3M provided an assessment of the soil and groundwater data collected from the site. The findings concluded that there were data gaps remaining and further investigation would be necessary. In response to the information presented at the meeting, the Department requested that 3M prepare and submit an addendum to the RFI Work Plan. The document was prepared and submitted to the Department in June 2002 and approved by the Department during the same month. In addition to describing necessary investigations needed to close the data gaps associated with selected SWMUs and AOCs, the Addendum to the RFI Technical Investigation Plan (TIP) contained plans to evaluate the feasibility of implementing interim remedial measures (IRM) at the inactive landfill (SWMU 4). In October 2002, the Department and 3M met at the Weston Solutions, Inc. (Weston) office in Auburn, AL to discuss the progress of the activities associated with the Addendum to the RFI TIP. During this meeting, it was determined that it would be feasible to implement an IRM program at the inactive landfill. An IRM Work Plan was submitted to the Department in December 2002 and approved by the Department during the same month. The plan is currently being implemented and activities are projected to be complete by December 2004. In August 2003, the Department received and approved an RFI Report that discussed the activities and results associated with the RFI Work Plan and the Addendum to the RFI TIP. 3M is currently preparing a Corrective Measures Study (CMS) Report in response to the Department's August 2003 correspondence.

The 3M facility, in general, consists of three contaminated areas: the Film Plant, the Chemical Plant, and the inactive landfill. These three areas all have a separate groundwater plume associated with them. The primary chemicals of potential concern (COPCs) found in the Chemical Plant area are isopropyl ether (IPE) and other VOCs such as xylenes, ethylbenzene, toluene, acetone, 1,1-dichloroethylene (1,1-DCE), chloroethane, and trichloroethene (TCE). The primary COPCs found in the Film Plant area are 1,1,1-trichloroethane (1,1,1-TCA), 1,1-DCE, and chloroform. The primary COPCs found in the inactive landfill area are IPE, acetone, benzene, toluene, ethylbenzene and xylenes.

IV. CONCLUSION FOR CA725

The appropriate status code to be entered for RCRAInfo event code CA725 (Current Human Exposures Under Control) is "YES." Based on the results of soil, sediments and surface water sampling conducted to characterize potential releases from SWMUs and AOCs at the 3M facility as presented in the RFI Report, constituents were detected below levels currently presenting a threat to human health and the environment. The criteria used in evaluating the analytical data were those specified in the approved RFI Report.

V. CONCLUSION FOR CA750

The appropriate status code to be entered for RCRAInfo event code CA750 (Migration of Groundwater Under Control) is "YES". Based on the review and analysis of the 1979 – 2002 groundwater monitoring data, it appears that the three contaminant plumes at this site are under hydraulic control.

VI. SUMMARY OF FOLLOW-UP ACTIONS

Currently, 3M is in the process of implementing the inactive landfill IRM program at the site. The purpose of the IRM program is to upgrade the existing cap at the inactive landfill area, and contain the source of contaminants to mitigate impacts or potential impacts from the area to groundwater and the surrounding environment. Additionally, 3M is in the process of preparing a CMS Report with the objective of addressing possible corrective measures for the remaining portions of the facility that require additional controls and corrective actions to ensure the continuing protection of human health and the environment.

- Attachments:
1. CA725: Current Human Exposures Under Control
 2. CA750: Migration of Contaminated Groundwater Under Control

BCE / 3M Company EI Memo

ATTACHMENT 1
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
RCRAInfo Event Code (CA725)
Current Human Exposures Under Control

Facility Name: 3M Company
Facility Address: Decatur, Morgan County, Alabama
Facility EPA ID #: ALD 004 023 164

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

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

If no - re-evaluate existing data, or

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

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Current Human Exposures Under Control" EI

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

Relationship of EI to Final Remedies

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

Duration /Applicability of EI Determinations

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

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

Media	Yes	No	?	Rationale/Key Contaminants
Groundwater	X			
Air (indoors) ²		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water		X		
Sediment		X		
Subsurface Soil (e.g., >2 ft)		X		
Air (outdoors)		X		

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

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

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

Rationale and Reference(s):

Groundwater:

Historical and recent sampling at the 3M Decatur facility confirms that hazardous constituents are present in groundwater at concentrations above risk-based criteria for protection of human health and the environment. Analytical results for groundwater samples collected at the site illustrate detection of a limited number of hazardous constituents that exceeded their respective medium-specific risk-based screening concentrations (RBSCs).

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

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

Following the evaluation of the facility investigation data, chemicals were selected as COPCs (see Section 6.3.4 of the RFI Report) for their respective groundwater plume and evaluated in the baseline human health risk assessment (BHHRA) for the industrial/maintenance worker scenario. Chloride, chlorodibromomethane, IPE, arsenic, and lead were evaluated as COPCs for the Inactive Landfill plume. Benzene, TCE, vinyl chloride (VC), chloride, IPE, arsenic, and lead were evaluated as COPCs for the Chemical Plant plume. Chloride, IPE, 2-methylnaphthalene, phenanthrene, and lead were evaluated as COPCs for the Film Plant plume. The primary plumes of concern are the plume that resides beneath the Chemical Plant and the Inactive Landfill.

Subsurface Soil:

Based on the results of soil sampling and analysis conducted to characterize potential releases from SWMUs and AOCs at 3M under the RFI Report, constituents found within the subsurface soil were detected below screening criteria for restricted land use. The criteria used in evaluating the subsurface soil data were those specified in the RFI Report. Analytical results for subsurface soil samples collected at 3M illustrate detection of a limited number of hazardous constituents that exceeded their RBSCs. Following the evaluation of the facility investigation data, chemicals were selected as COPCs (see Section 6.3.4 of the RFI Report) for their respective area of contamination and evaluated in the BHHRA for the utility worker scenario (the only subsurface soils that exceeded their respective RBSCs were located along the natural gas pipeline located north of the Inactive Landfill). Those chemicals that were selected as COPCs and evaluated were IPE, arsenic, chromium, and lead. As a result of the BHHRA, the contaminants present in the subsurface soil do not pose a potential threat to human health.

Surface Soils and Sediments:

Based on the results of sampling and analysis conducted to characterize potential releases from SWMUs and AOCs at the site under the RFI, constituents found within the surface soils and sediments were not detected above screening criteria for restricted use. The criteria used in evaluating the surface soil and sediment data were those specified in the RFI Report. As specified in the Section 6.3.4.2 of the RFI Report, the evaluation of "surface soils and drainage sediments (located near the inactive landfill) were combined because the drainage sediments are only wet seasonally and are more frequently in the dry (soil-like) state." Analytical results for surface soil samples collected at the site show that a limited number of hazardous constituents were selected as COPCs for their respective area of contamination and evaluated in the BHHRA for the industrial/maintenance worker scenario. The chemicals that were selected as COPCs and evaluated were IPE, ammonia, arsenic, chromium, and lead. Sediments collected in Baker's Creek and the Tennessee River were analyzed to determine the COPCs and then evaluated in the BHHRA for the adult and older child (aged 7 to 16 years of age) recreational fisherman scenarios. IPE, arsenic, and chromium were detected in the sediments within Baker's Creek and selected as COPCs and evaluated in the BHHRA. Chlorodibromomethane, benz(a)anthracene, benzo(a)pyrene, arsenic, ammonia, barium, and lead were detected in the sediments within the Tennessee River and selected as COPCs and evaluated in the BHHRA. As a result of the BHHRA, the COPCs present in the surface soils and sediments do not pose a potential threat to human health.

Surface Water:

Based on the results of sampling and analysis conducted to characterize potential releases from SWMUs and AOCs at the site under the RFI, constituents found in the surface water were detected below screening criteria appropriate for restricted use. The criteria used in evaluating the surface water data were those specified in the RFI Report. Analytical results for surface water samples collected at the site were used to select COPCs for their respective area of contamination and evaluated in the BHHRA for the adult and older child recreational fisherman scenario. Those chemicals detected in Baker’s Creek which were selected as COPCs and evaluated were acetone, bromodichloromethane, chloroform, styrene, TCE, bis(2-ethylhexyl)phthalate, nickel (total), nickel (dissolved), IPE, mercury (dissolved), mercury (total), ammonia (total), chromium (total). Those chemicals detected in the Tennessee River, selected as COPCs and evaluated were acetone, benzene, 1,1-Dichloroethane (1,1-DCA), 1,2-Dichloroethane (1,2-DCA), TCE, bis(2-ethylhexyl)phthalate, IPE, nickel (total), ammonia (total), silver (total), silver (dissolved), barium (total), chromium (total), lead (total), and mercury (total).

In addition to the collection and evaluation of the surface water data, fish tissue concentrations were calculated using a mathematical model that utilized the surface water data and carried through the BHHRA for estimating fish consumption exposure and risk. This resulted in the calculations of the cancer risks and the hazard quotients for the adult and older child recreational fisherman scenarios (Table 6-15 of the RFI Report). As a result of the BHHRA, neither the surface water or the fish existing within the body of water are suspected to contain COPCs above levels considered to pose a potential threat to human health.

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

Summary Exposure Pathway Evaluation Table							
Potential Human Receptors (Under Current Conditions)							
“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food³
<u>Groundwater</u>	no	no	no	no	no	no	no
<u>Air (indoors)</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Soil (surface, e.g., <2 ft)</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Surface Water</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Sediment</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Soil (subsurface, e.g., >2 ft)</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C
<u>Air (outdoors)</u>	N/C	N/C	N/C	N/C	N/C	N/C	N/C

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not “contaminated” as identified in #2, please strike-out specific Media, including Human Receptors’ spaces, or enter “N/C” for not contaminated.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

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

Instructions for Summary Exposure Pathway Evaluation Table:

1. For Media which are not “contaminated” as identified in #2, please strike-out specific Media, including Human Receptors’ spaces, or enter “N/C” for not contaminated.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

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

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

Rationale and Reference(s):

Groundwater:

Under the current conditions at the 3M facility, there is not a complete pathway between the groundwater contamination and human receptors. As their source of potable water, the facility utilizes the water treated at Decatur Utilities which obtains the water from the Tennessee River. Groundwater flow is predominantly in a northeastern direction toward Baker’s Creek and the Tennessee River. Contaminated groundwater is contained within the facility boundary. Currently, 3M is preparing a CMS Report that will contain a corrective action program designed to eliminate or minimize the possibility of future significant risks that would affect human health and the environment in an adverse manner. Prior to the submittal and approval of the CMS Report, the groundwater will continue to be monitored on a quarterly basis in accordance with 3M’s site-wide groundwater sampling program to ensure the ongoing protection of human health.

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

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

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

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

_____ If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

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

_____ If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

_____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code.

Rationale and Reference(s):

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

 X YE - Yes, “Current Human Exposures Under Control” has been verified. Based on a review of the information contained in this EI Determination, “Current Human Exposures” are expected to be “Under Control” at the 3M Company facility, EPA ID # ALD 004 023 164, located in Decatur, Alabama under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

_____ NO - “Current Human Exposures” are NOT “Under Control.”

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

Completed by:

(signature)



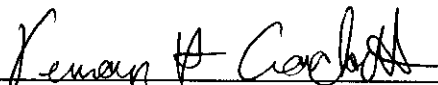
(date)

9/10/2003

Brian C. Espy
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

Supervisor:

(signature)



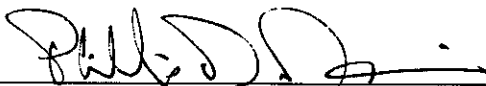
(date)

9/10/2003

Vernon H. Crockett, Chief
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

Industrial Hazardous:
Waste Branch Chief

(signature)



(date)

10-SEP-03

Phillip D. Davis, Chief
Industrial Hazardous Waste Branch
Land Division

Location where References may be found:

Alabama Department of Environmental Management Main Office
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2059
(334) 271-7700

Contact telephone number and e-mail address:

Brian C. Espy
(334) 271-7749
bespy@adem.state.al.us

ATTACHMENT 2
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
RCRAInfo Event Code (CA750)
Migration of Contaminated Groundwater Under Control

Facility Name: 3M Company
Facility Address: Decatur, Morgan County, Alabama
Facility EPA ID #: ALD 004 023 164

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

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

If no - re-evaluate existing data, or

If data are not available, skip to #8 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final Remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, (GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration/Applicability of EI Determinations

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

2. Is **groundwater** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

 X If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

_____ If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

As indicated in Attachment 1, historical and recent sampling at the 3M facility confirms that hazardous constituents are present in groundwater at concentrations above risk-based criteria for protection of human health and the environment. Analytical results for groundwater samples collected at the site illustrate detection of a limited number of hazardous constituents that exceeded their respective medium-specific risk-based screening concentrations (RBSCs). Following the evaluation of the facility investigation data, chemicals were selected as COPCs (see Section 6.3.4 of the RFI Report) for their respective groundwater plume and evaluated in the baseline human health risk assessment (BHHRA) for the industrial/maintenance worker scenario. Chloride, chlorodibromomethane, IPE, arsenic, and lead were evaluated as COPCs for the Inactive Landfill plume. Benzene, TCE, vinyl chloride (VC), chloride, IPE, arsenic, and lead were evaluated as COPCs for the Chemical Plant plume. Chloride, IPE, 2-methylnaphthalene, phenanthrene, and lead were evaluated as COPCs for the Film Plant plume. The primary plumes of concern are the plume that resides beneath the Chemical Plant and the Inactive Landfill.

3. Has the **migration** of contaminated groundwater **stabilized** such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”² as defined by the monitoring locations designated at the time of this determination?

 X If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the “existing area of groundwater contamination”⁶).

¹“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the groundwater resource and its beneficial uses).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”²) - skip to #8 and enter “NO” status code, after providing an explanation.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Groundwater investigations at the 3M facility have occurred since 1979 and currently groundwater wells are being sampled on a quarterly basis in accordance with 3M’s site-wide groundwater sampling program. Analytical data from 1979 – 1996 is presented in the DCC Report and the data from 1997 – 2002 can be located in the RFI Report. The sampling results from the previous monitoring events confirm that the migration of contaminated groundwater is under control. 3M has recently completed the activities described in the Addendum to the RFI TIP (Addendum). One of the primary purposes of the activities described in the Addendum was to close the data gaps associated with the nature and extent of the contaminated groundwater plumes. Upon completion of the activities, the Department and 3M agreed that the data gaps had been addressed and the groundwater was now defined both horizontally and vertically. In addition to the complete delineation of the groundwater plumes, 3M is currently preparing a CMS Report that will address additional corrective action steps that 3M will take to restrict any additional migration of the groundwater plumes. Furthermore, 3M has begun the implementation of the Inactive Landfill IRM program at the site. The objectives of the program are to minimize infiltration of rainfall into the inactive landfill to reduce recharge, to restrict lateral groundwater flow under the landfill to reduce residuum groundwater movement, and to contain affected residuum groundwater near the landfill to prevent it from entering the deeper bedrock limestone. Additional information regarding the IRM program can be located in the Work Plan for the Inactive Landfill IRM Program dated December 2002 and in Section 8 of the RFI Report.

4. Does “contaminated” groundwater **discharge** into **surface water** bodies?

 X If yes - continue after identifying potentially affected surface water bodies.

_____ If no - skip to #7 (and enter a “YE” status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater “contamination” does not enter surface water bodies.

_____ If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

Investigations by 3M have indicated that there are two seeps (OS-02 and OS-05) down-gradient (north) from the former incinerator site. The investigation also indicated a presence of three springs (OS-01, OS-03, and OS-04) in Wheeler Reservoir downgradient of the waste solvent transfer area. The investigation did indicate a presence of volatile organic constituents (VOCs) associated with the discharges.

²“existing area of contaminated groundwater” is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of “contamination” that can and will be sampled/tested in the future to physically verify that all “contaminated” groundwater remains within this area, and that the further migration of “contaminated” groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be “**insignificant**” (i.e., the maximum concentration⁸ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater “level,” and there are no other conditions (e.g., the nature and number of discharging contaminants, or environmental setting) which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

 X If yes - skip to #7 (and enter “YE” status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration⁸ of key contaminants discharged above their groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) providing a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of “contaminated” groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration⁸ of each contaminant discharged above its groundwater “level,” the value of the appropriate “level(s),” and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater “levels,” providing the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identifying if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter “IN” status code in #8.

Rationale and Reference(s);

Groundwater investigations at the 3M facility have concluded that there are a limited number of discharges from groundwater into surface water bodies that border the site. All of the discharge points have been investigated and were evaluated in the BHHRA (See the RFI Report). In its final determination, the data interpretations resulting from the BHHRA concluded that there are no significant risks to human health or the environment associated with any of the groundwater discharges into surface water.

6. Can the **discharge** of “contaminated” groundwater into surface water be shown to be “**currently acceptable**” (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either:
1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site’s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR

³As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

⁴Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

2) providing or referencing an interim assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of trained specialists, including ecologists) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

 X If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):

As indicated in earlier discussions, 3M has instituted a site-wide groundwater sampling program. Wells are currently being sampled on a quarterly basis and the results are reported to the Department during frequent meetings and conference calls. In addition to a regular groundwater monitoring program, 3M has recently begun the installation of controls in and around the Inactive Landfill that will more appropriately stabilize the source of the Inactive Landfill plume and it will prevent any possible future migration of the groundwater plume in the area. Furthermore, 3M is currently preparing a CMS Report that will address appropriate corrective measures that will be taken by 3M to better control the groundwater contamination in the Chemical Plant area.

⁵The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

8. Check the appropriate RCRAInfo status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

YE YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the 3M facility, EPA ID # ALD 004 023 164, located in Decatur, Alabama. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed or expected.

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

Completed by: (signature) Brian C. Espy (date) 9/10/2003
Brian C. Espy
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

Supervisor: (signature) Vernon H. Crockett (date) 9/10/2003
Vernon H. Crockett, Chief
Engineering Services Section
Industrial Hazardous Waste Branch
Land Division

Industrial Hazardous: (signature) Phillip D. Davis (date) 10-SEP-03
Waste Branch Chief
Phillip D. Davis, Chief
Industrial Hazardous Waste Branch
Land Division

Location where References may be found:

Alabama Department of Environmental Management Main Office
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2059
(334) 271-7700

Contact telephone number and e-mail address:

Brian C. Espy
(334) 271-7749
bespy@adem.state.al.us