PLAINTIFF'S EXHIBIT
UC-4023

ATI
ASBESTOS TESTING INC.
5205 NOYES AVE. • CHARLESTON, WV 25304 • (304) 925-6795

November 18, 1986

Erik A. Osby
Industrial Hygiene Dept.
Union Carbide Corporation
P.O. Box 2831
Charleston, WV 25330

The following bulk insulation analysis pertain to samples received on 11/14/86. All bulk insulation analyses are performed in accordance with EPA recommendations concerning analysis of bulk insulation using Polarized Light Microscopy.

ANALYSIS RESULTS

Sample #1	
Roofing material-Bldg. 190	70%-Asbestos (Chrysotile) 30%-Epoxy Resin
Sample #2	
Ceiling material, womens' bathroom-Bldg. 190	N.D.-Asbestos* 5%-Cellulose 95%-Gunnite Clay
Sample #3	
Material deposited on compressor-Bldg. 190 11/13/86	N.D.-Asbestos* 5%-Mineral Wool 5%-Synthetics Fibers 35%-Dirt 55%-Paint
Sample #4	
Ten inch pipe insulation (mid-section)-Bldg. 308	15%-Asbestos (Chrysotile) 85%-Clay
Sample #5	
Verticle steamline insulation from hallway in mid-section of Bldg. 308	35%-Asbestos (Chrysotile) 65%-Clay

Respectfully submitted,

John S. Ferrell
Industrial Hygienist

*N.D. denotes none detected.

ATI
ASBESTOS TESTING INC.
5205 NOYES AVE. • CHARLESTON, WV 25304 • (304) 925-6795 October 23, 1986

Erik A. Osby
Industrial Hygiene Dept.
Union Carbide Corporation
P.O. Box 2831
Charleston, WV 25330

The following bulk insulation analysis results pertain to samples received on 10/21/86. All bulk insulation analysis is performed in accordance with EPA recommendations concerning analysis of bulk insulation using *Polarized Light Microscopy*.

ANALYSIS RESULTS

Sample #1	N.D.-Asbestos 1%-Mineral Wool 5%-Cellulose 94%-Clay
Sample #2	N.D.-Asbestos 1%-Mineral Wool 99%-Foam Glass
Sample #3	5%-Asbestos (Chrysotile) 10%-Cellulose 85%-Foam Glass
Sample #4	85%-Asbestos (5%-Amosite) (80%-Chrysotile) 15%-Clay
Sample #5	40%-Asbestos (10%-Amosite) (30%-Chrysotile) 60%-Clay
Sample #6	15%-Asbestos (Amosite) 85%-Clay

Respectfully submitted,

John S. Ferrell
Industrial Hygienist

Union Carbide
Agricultural Products Company, Inc.
Institute Plant

RECEIVED
OCT 23 1986
D. A. DUGA

INDUSTRIAL HYGIENE SAMPLING RESULTS

TO: Mr. F. Boggs
Building 303
Institute Plant

COPIES TO: Mr. D. A. Duga
Mr. C. E. Miller
Mr. D. D. Miller
Mr. M. E. Tapp
Mr. L. W. Youngblood

Purpose: ____ Quarterly __X__ Semiannually ____ Annually
____ Regulatory Agency Inspection ____ Other (See Comments)

Sample Date(s): August 1, 4 and 5, 1986
Sample Location: Landfill Department No.: 308
Process/Activity: Waste Disposal
Contaminant: Asbestos
Exposure Limit: OSHA 0.2 fibers/cc (TWA_8); - (TWA_{12})
ACGIH 0.2 fibers/cc (TWA_8); - (TWA_{12})
UCC - (TWA_8); - (TWA_{12})
AIHA - (TWA_8); - (TWA_{12})
Sample Type: __X__ Personal __X__ Area ____ Source
____ Surface Wipe ____ Other (See comments)
Analytical Method: Per 29 CFR 1910.1001, Appex. A
Results: ____ See Comments __X__ See Attached Table

COMMENTS: Four job positions at the Goff Mountain Landfill were monitored for exposure to airborne asbestos fibers on the above dates. Area concentrations of airborne asbestos were measured too. The monitoring encompassed typical asbestos waste disposal, which consisted of using a front end loader and a bulldozer to blend the material with dirt and pack it down. The front end loader and bulldozer each were equipped with enclosed cabs and air conditioning units that provided filtered, cooled air to the cabs. In addition, the equipment operators wore half-mask dual-cartridge dust respirators while in the cabs.

The monitoring also covered operation of the drum crusher and typical area cleanup by the laborer. Cleanup consisted of sweeping the paved area around the landfill office and removing debris from the perimeter of the landfill.

Due to the hot and dry weather, "worst case" conditions existed during the survey regarding the potential for generation of airborne asbestos fiber concentrations. The monitoring and analytical procedures were performed in accordance with 29 CFR 1910.1001, including Appendix A.

The personal monitoring results for the laborer and environmental specialist job positions were all below the PEL as well as the action level (ie, one-half the PEL) for asbestos. The front end loader and bulldozer operators' exposures also were below the PEL though they did reach the 0.1 fiber/cc action level. The area monitoring results showed that concentrations of airborne asbestos fibers greater than the PEL were generated in the immediate vicinity of the bulldozer and front end loader while they were being used to blend and fill asbestos waste material. However, the extremely low concentration measured directly downwind of the disposal area at the drum crushing facility showed that the airborne asbestos fibers rapidly settled and/or dissipated within the confines of the landfill.

Based on the above results the following actions are required:

- A copy of these monitoring results must be posted immediately in the workplace (ie, the landfill office) where they will be accessible to all affected employees (including contract employees) for review. The affected employees should be made aware that the results have been posted. (Note: this was done prior to issuance of this report).

- Because airborne asbestos fiber concentrations measured at the disposal area during blending and filling exceeded the PEL, the "face" of the landfill must be established as a regulated area as soon as possible but no later than November 17, 1986. This requires:

  1. Posting of warning signs in conformance with the requirements of 29 CFR 1910.1001 (J)(1)(i) and (ii) to identify the regulated area.

  2. Prohibition of eating, drinking, smoking, application of cosmetics and tobacco and gum chewing in the regulated area.

  3. Use of half-mask air-purifying respirators equipped with high efficiency filters (or better*) by anyone entering the regulated area, regardless of duration.

     *Note: Powered air purifying respirators must be provided to employees if they choose to use that type of respirator. In addition, employees using negative pressure respirators must be fit tested before entering the asbestos regulated area and they must be fit tested every six months thereafter. Selection, use and care of respirators must be in accordance with the requirements of 29 CFR 1910.1001 (G).

- Training must be provided to the front end loader and bulldozer operators no later than October 20, 1986 and at least annually thereafter since these two job positions were exposed to airborne

concentrations of asbestos fibers at the action level. Training must cover the topics shown in 29 CFR 1910.1001 (J)(5).

- Medical surveillance must be provided or made available to the front end loader and bulldozer operators no later than November 17, 1986 and at least annually thereafter since these two job positions were exposed to airborne concentrations of asbestos fibers at the action level. Medical surveillance must be performed in accordance with 29 CFR 1910.1001(L).

RECOMMENDATIONS: In order to complete implementation of the above required activities, the following recommendations are made:

1. Per the advice of Employee Relations Department and Medical Department supervision, Environmental Protection Department supervision should immediately pursue the establishment of a contract between Union Carbide and Henson Brothers, Inc. in order to provide asbestos training, medical surveillance, respirator fit testing (if necessary) and respirator training to the bulldozer and front end loader operators on a fee-for-service basis. When the contract is established, Industrial Hygiene personnel will be available to provide the required training and fit testing, upon request.

2. Environmental Protection Department supervision should take appropriate steps as soon as possible to insure that a sufficient quantity of suitable respirators are on hand for the heavy equipment operators and the Institute Plant truck drivers who must enter the regulated area. In addition, a routine program (if one does not

already exist) should be established with Safety Supply for the cleaning, disinfecting, inspection and repair of the respirators.

3. Maintenance Area VI supervision should contact this office as soon as possible to coordinate the respirator fit testing and training that is required for Institute Plant truck drivers to enter the landfill regulated area. (Note: Already underway at this time.)

4. Environmental Protection Department supervision should contact this office for assistance in establishing the regulated area at the landfill. (Note: Already underway at this time.)

Report Date: October 17, 1986

Signed: Erik A. Oslby Bldg. 2 Room: 172 Phone 6105

NOTE: ALL PERSONAL SAMPLE RESULTS MUST BE DISCUSSED WITH THE PARTICIPATING EMPLOYEE

Union Carbide
Agricultural Products Company, Inc.
Institute Plant

INDUSTRIAL HYGIENE SAMPLING RESULTS

WORKPLACE LOCATION: Landfill NAME(s) OF SAMPLER(s): E.A. Osby & J.L. Miller

CONTAMINANT: Asbestos REPORT DATE: October 17, 1986

OSHA PEL: TWA_8 0.2 Fibers/cc, TWA_{12} - ACGIH TLV: TWA_8 0.2 Fibers/cc, TWA_{12} -

AIHA WEEL: TWA_8 - , TWA_{12} - UCC GUIDELINE: TWA_8 - , TWA_{12} -

Sample Number	Sample Date	Sample Description	Sample Time (min.)	Sample Results (fibers/cc)*
		Front End Loader Operator		
W-4700-AA7915	8-1-86	L. E. Pauley	265	* *
W-4700-AA7923	8-1-86	L. E. Pauley	125	* *
W-4701-AA7925	8-4-86	L. E. Pauley	170	0.11
W-4701-AA7932	8-4-86	L. E. Pauley	225	0.099
				0.10
W-4702-AA7935	8-5-86	L. E. Pauley	375	0.068
		Bulldozer Operator		
W-4700-AA7916	8-1-86	C. E. Wheeler	265	0.051
W-4700-AA7924	8-1-86	C. E. Wheeler	120	0.17
				0.09
W-4701-AA7926	8-4-86	C. E. Wheeler	170	0.097
W-4701-AA7933	8-4-86	C. E. Wheeler	225	0.10
				0.099
W-4702-AA7936	8-5-86	C. E. Wheeler	180	0.087
W-4702-AA7940	8-5-86	C. E. Wheeler	195	0.12
				0.10

Sample Number	Sample Date	Sample Description	Sample Time (min.)	Sample Results (fibers/cc)*
		Senior Enviromental Specialist		
W-4700-AA7917	8-1-86	J. R. Fizer	375	0.01
W-4701-AA7927	8-4-86	J. R. Fizer	395	0.018
W-4702-AA7938	8-5-86	J. P. Monroe	205	0.028
		Teague Laborer		
W-4701-AA7928	8-4-86	R. L. Barker	303	0.021
W-4701-AA7934	8-4-86	R. L. Barker	90	0.016
				0.020
W-4702-AA7937	8-5-86	R. E. Barker	370	0.029
W-4700-AA7918	8-1-86	Back end of front end loader while asbestos was being worked into landfill	35	0.39
W-4700-AA7922	8-1-86	Back end of front end loader while asbestos was being worked into landfill	10	1.2
W-4701-AA7929	8-4-86	Back end of front end loader while asbestos was being worked into landfill	15	* *
W-4700-AA7919	8-1-86	Drum crusher area	304	0.0047
W-4702-AA7939	8-5-86	On side of bulldozer while asbestos was being worked into landfill	15	0.98

* Personal sample results are reported as time-weighted averages.

** Sample could not be analyzed for asbestos fibers due to excessive dust accumulation.

ATI
ASBESTOS TESTING INC.
5205 NOYES AVE. • CHARLESTON, WV 25304 • (304) 925-6795

October 5, 1986

Ed McComas
Industrial Hygiene Dept.
Union Carbide Corporation
P.O. Box 2831
Charleston, WV 25330

The following analysis result pertains to a sample received 10/2/86. All bulk insulation analysis is performed in accordance with EPA recommendations concerning the analysis of bulk insulation using polarized light microscopy.

ANALYSIS RESULT

Sample #1

Building 236, Locker Room
steamline

15%-Asbestos
(10%-Amosite)
(5%-Chrysotile)
85%-Clay

Respectfully submitted,

John S. Ferrell
Industrial Hygienist

ATI
ASBESTOS TESTING INC.
5205 NOYES AVE. • CHARLESTON, WV 25304 • (304) 925-6795

August 8, 1986

Erik A. Osby
Industrial Hygiene Dept.
Union Carbide Corporation
P.O. Box 2831
Charleston, WV 25330

The following bulk insulation analysis results pertain to samples received on 8/1/86 and 8/7/86. All bulk insulation analysis is performed in accordance with EPA recommendations concerning analysis of bulk insulation using polarized light microscopy.

ANALYSIS RESULTS

Sample #1 (8/1/86)

EtO transfer line of the glycol unit — 5%-Nylon, 95%-Foam

Sample #2 (8/7/86)

Insulation from the South Charleston EtO Line — 1%-Mineral Wool, 99%-Foam

Respectfully submitted,

John S. Ferrell

John S. Ferrell
Industrial Hygienist

ATI
ASBESTOS TESTING INC.
5207 NOYES AVE. • CHARLESTON, WV 25304 (304) 925-6795

July 11, 1986

Erik Osby
Union Carbide Corp.-Institute
Industrial Hygiene Dept.
P.O. Box 2831
Charleston, WV 25330

The following analysis of bulk insulation pertain to samples received on 6/10/86. All bulk insulation analysis is performed in accordance with EPA recommendations concerning analysis of bulk insulation using polarized light microscopy.

ANALYSIS RESULTS

Sample #1

Nonyl Phenol-Header Passing, #4 reactor

22%-Asbestos
(2%-Amosite)
(20%-Chrysotile)
78%-Clay

Sample #2

6-inch line-ground level, north #4 reactor

10%-Asbestos
90%-Clay

Sample #3

Water and steam outlet, #4 reactor, heat exchanger

0%-Asbestos
20%-Mineral Wool
75%-Clay
5%-Vermiculite

Respectfully submitted,

John S. Ferrell

John S. Ferrell
Industrial Hygienist

ATI
ASBESTOS TESTING INC.
5207 NOYES AVE. • CHARLESTON, WV 25304 (304) 925-6795

June 6, 1986

RECEIVED
JUN 9 1986
INDUSTRIAL HYG. - U.C.C.

Erik A. Osby
Industrial Hygiene Dept.
Union Carbide Corporation
P.O. Box 2831
Charleston, W.V. 25330

The following analysis results pertain to samples received 6/6/86. All bulk insulation analysis is performed in accordance with EPA recommendations concerning analysis of bulk insulation using polarized light microscopy.

ANALYSIS RESULTS

Samole #1

Building 303.
Basement Ceiling Tile

0%-Asbestos
90%-Mineral Wool
5%-Cellulose
5%-Glue

Samole #2

Building 303.
Southeastern Pipe
Insulation

25%-Asbestos
(20%-Amosite)
(5%-Chrysotile)
75%-Magnesite

Respectfully submitted,

John S. Ferrell

John S. Ferrell
Industrial Hygienist

ATI
ASBESTOS TESTING INC.
5207 NOYES AVE. • CHARLESTON, WV 25304 (304) 925-6795

June 5, 1986

RECEIVED
JUN 9 1986
SAFETY - I.H.

Erik A. Osby
Industrial Hygiene Dept.
Union Carbide Corporation
P.O. Box 2831
Charleston, W.V. 25330

The following analysis result pertain to samples received 6/3/86. All bulk insulation analysis is performed in accordance with EPA recommendations concerning analysis of bulk insulation using polarized light microscopy.

ANALYSIS RESULTS

Sample #1

Phosgene Control Room Insulation-Steamline	15%-Asbestos (15% Amosite) 85%-Clay

Respectfully submitted,

John S. Ferrell

John S. Ferrell
Industrial Hygienist

ATI
ASBESTOS TESTING INC.
5207 NOYES AVE. • CHARLESTON, WV 25304 (304) 925-6795

April 16, 1986

RECEIVED
APR 21 1986
SAFETY - I. H.

Erik A. Osby
Industrial Hygiene Dept.
Union Carbide Corporation
P.O. Box 2331
Charleston, W.V. 25330

Mr. Osby,

The bulk insulation sample results pertain to samples received on 4/17/86. All bulk insulation analysis is performed in accordance with EPA recommendations concerning analysis of bulk insulation using polarized light microscopy.

ANALYSIS RESULTS

Sample #1

Mechanical Room,
first floor-Bldg. 304

20%-Asbestos
(5%-Amosite)
(15%-Chrysotile)
15%-Mineral Wool
65%-Clay

Sample #2

Wall Panel,
second floor-Bldg. 304

20%-Asbestos
(20%-Chrysotile)
55%-Cellulose
20%-Clay
5%-Glue

Sample #3

Furnace Insulation,
second floor-Bldg. 304

25%-Asbestos
(5%-Amosite)
(20%-Chrysotile)
60%-Mineral Wool
15%-Clay

Sample #4

Pipe Insulation,
second floor-Bldg. 304

20%-Asbestos
(15%-Amosite)
(5%-Chrysotile)
80%-Clay

Sample #5

Ceiling Tile.
third floor, Bldg. 304

0%-Asbestos
95%-Cellulose
5%-Glue

Sample #6

Ceiling Panel,
third floor. Bldg. 304

0%-Asbestos
95%-Mineral Wool
5%-Clay

Respectfully submitted,

John S. Ferrell

John S. Ferrell
Industrial Hygienist

ATI
ASBESTOS TESTING INC.
5207 NOYES AVE. • CHARLESTON, WV 25304 (304) 925-6795

April 16, 1986

Guy L. Arbaugh
Union Carbide Corp.- Institute Plant
Building #2 Room 172
P.O. Box 2831
Charleston, W.V. 26062

Mr. Arbaugh,

The following bulk asbestos analysis results pertain to samples received on 4/15/86. Please note that all analysis of bulk asbestos samples are analyzed per EPA procedural recommendations concerning bulk asbestos analysis using polarized light microscopy. Thank you for your consideration.

ANALYSIS RESULTS

Sample #1

Taken by
C. Burriss

0%-Asbestos
5%-Paint
95%-Magnesite

Sample #2

Taken by
C. Miller

0%-Asbestos
1%-Mineral Wool
99%-Calcite

Respectfully submitted,

John S. Ferrell

Union Carbide
Agricultural Products Company, Inc.
Institute Plant

INDUSTRIAL HYGIENE SAMPLING RESULTS

TO: Mr. P. J. Morris
Building 23
Institute Plant

COPIES TO: Mr. M. Adkins, Jr.
Mr. C. R. Thomas
Mr. L. W. Youngblood

Purpose: _____ Quarterly _____ Semiannually _____ Annually
_____ Regulatory Agency Inspection __x__ Other (See Comments)

Sample Date(s): December 19, 1985
Sample Location: MIC-II Unit - Maint. Comp. 7 Department No.: 327
Process/Activity: Pipe insulation removal
Contaminant: Asbestos
Exposure Limit: OSHA 2 fibers/cc ACGIH _____
UCC _____
Sample Type: __x__ Personal __x__ Area _____ Source
_____ Surface Wipe _____ Other (See comments)
Analytical Method: NIOSH 7400
Results: _____ See Comments __x__ See Attached Table

COMMENTS: A Maintenance Complex 7 insulator/painter was monitored for exposure to airborne asbestos fibers on the above date. Area concentrations of airborne asbestos fibers were measured too. Monitoring was performed while insulation was being stripped from pipes that were lying on a plastic sheet inside the dike wall that surrounds the old phthalic anhydride tanks at the MIC-II Unit. It was not necessary to wet the insulation as it was being removed because it had become water logged and, at the time of removal, was frozen due to the cold weather. Nevertheless, respirators and protective clothing were worn by the three men performing the work.

Since the airborne fiber concentration was unknown at the time of sampling, two sets of samples (having different sample times) were taken to insure that at least one of the sets would produce valid results. All monitoring results were below the lower calibration limit for the analytical

Union Carbide
Agricultural Products Company, Inc.
Institute Plant

INDUSTRIAL HYGIENE SAMPLING RESULTS - CONTINUED

method, which is well below the OSHA permissible exposure limit. Area concentrations and personal exposures to airborne asbestos fibers were maintained at safe levels during this job.

RECOMMENDATIONS: None

Report Date: January 14, 1986

Signed: Eric A. Osley Bldg. 2 Room: 172 Phone 6105

NOTE: ALL PERSONAL SAMPLE RESULTS MUST BE DISCUSSED WITH THE PARTICIPATING EMPLOYEE

1335k

Union Carbide
Agricultural Products Company, Inc.
Institute Plant

INDUSTRIAL HYGIENE SAMPLING RESULTS

WORKPLACE LOCATION: MIC-II Unit, Maint. Comp. 7 SAMPLER'S NAME: E. A. Osby

CONTAMINANT: Asbestos REPORT DATE: January 14, 1986

Sample Number	Sample Date	Sample Description	Sample Time (min.)	Sample Results (fibers/cc)
		INSULATOR/PAINTER		
W-4409-1	12-19-85	D. C. Chambers	60	< 0.10
W-4409-4	12-19-85	D. C. Chambers	18	< 0.32
				TWA=< 0.02
W-4409-2	12-19-85	East side of insulation removal site - 3 feet from activity.	60	< 0.10
W-4409-5	12-19-85		16	< 0.36
W-4409-3	12-19-85	Northwest side of insulation removal site - 5 feet from activity.	60	< 0.10
W-4409-6	12-19-85		15	< 0.38

1335k

ENVIRONMENTAL HEALTH LABORATORY
1021 Georgia Ave. / Macon, Georgia 31201
(800) 841-8919 / In GA (912) 745-4702
LABORATORIES IN MACON, GA AND HARTFORD, CT

RECEIVED
JAN 17 1986
SAFETY - I. H.

LABORATORY ANALYSIS REPORT

To: E. A. Osby

Account: Union Carbide Argricultural Products Co., Inc.

Location: P. O. Box 2831
Charleston, WV 25301

Report No.: 86A0007 Revised

Purchase Order No.: N/A

Date Received: 01-03-86

Date Reported: 01-14-86

Analysis: Fiber Count
Analytical Method: NIOSH 7400; Phase Contrast Microscopy; Walton-Beckett Reticle; 450 x magnification

Sample No. (AA)	Air Volume (Liters)	Fibers, longer than 5 microns, per cc of air.
W-4409-1	120	<0.095
W-4409-2	120	<0.095
W-4409-3	120	<0.095
W-4409-4	36	<0.32
W-4409-5	32	<0.36
W-4409-6	29.8	<0.38

cc= Cubic Centimeter.

A blank filter was not provided. We recommend that a blank be submitted with each set of samples so that the sampling media can be checked for possible interferences or background contamination.

Chemist _____ Date: _____

Jeanne A. Gibbs

< = Less than