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March 31, 1998

Mr. Wm. Gerald Hardy, Chief
Hazardous Waste Branch Land Division
Alabama Department of Environmental Management
1751 Cong. W. L. Dickinson Drive
Montgomery, AL 36130-1463

Re: Interim Measures Report
Solutia Inc. Anniston, AL Facility
EPA ID No. ALD 004 019 048

Dear Mr. Hardy:

Attached is a report on the Interim Measures which were constructed at the Solutia Anniston Facility in 1997. An "as-built" construction report and a certification report for the upgrade to the cap on a portion of the South Landfill are currently being prepared and will be submitted to the Department by April 30, 1998. However, the attached report satisfies the requirements of condition III.F.3.b of the Part B Permit and is submitted in fulfillment of those requirements.

We trust that you find the report satisfactory.

Sincerely,

SOLUTIA INC.

Alan G. Faust
Manager of Remedial Projects

File: S06

Formerly the chemical businesses of Monsanto Company

1. INTRODUCTION

This Interim Measures Report has been prepared pursuant to the requirements of Condition III.F of the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) Post Closure Permit for the Solutia Facility (the facility) located in Anniston, Alabama (RCRA Permit # ALD 004 019 048). It summarizes the details of Interim Measures which were constructed at the facility in the period between May 15, 1997 and December 31, 1997. These measures were proposed by Solutia to minimize the potential for constituents to migrate from the facility in the future and were determined to be appropriate by the Alabama Department of Environmental Management (ADEM) in a letter dated March 11, 1997. The details of the Interim Measures were provided in a Work Plan, which was approved by ADEM in a letter dated July 28, 1997.

The specific measures proposed by Solutia (formerly Monsanto) included the following:

1. Divert stormwater run-on from the South Landfill (SWMU 1 and SWMU 2) and from the near-plant portion of AOC B. Convey the diverted water in pipeline and open channel through AOC B to a discharge point on the south side of the railroad tracks located north of Tenth Street. From there, convey the diverted water in an unnamed tributary to Snow Creek.
2. Upgrade the existing cap on portions of the South Landfill (SWMU 1 and SWMU 2).
3. Contain soils and sediments on properties within the portions of AOC B owned by Solutia and install piping to convey stormwater currently flowing into the East Drainage Ditch from a point just north of Highway 202 to the point where this ditch joins an unnamed tributary of Snow Creek north of Tenth Street.
4. Upgrade the in-plant stormwater sewer system and divert non-contact cooling water to the in-plant waste water treatment facility

5. Contain soils and sediments on property owned by Solutia downgradient of the West End Landfill.

The primary goal of these Interim Measures is to control stormwater and minimize the potential for migration of constituents from the facility. Previous sampling efforts at the facility demonstrated that the primary transport mechanism for potential constituents is surface water and, in particular, stormwater flows which exceed the capacity of the culvert systems in the drainage ways north and east of the Plant. Because the affected soils and sediments are generally confined to the areas adjacent to the drainage ways, a comprehensive stormwater management system and the isolation and containment of potentially affected soils provide the best means of achieving the primary goal of the Interim Measures program.

A detailed "as-built" construction report is currently being finalized, as is a certification report for the upgraded cap constructed on portions of the South Landfill. It is anticipated that these reports will be completed by the end of April 1998 and they will be submitted to ADEM at that time. This present report is intended to satisfy the requirements of Condition III.F of the Permit and, as such, briefly describes each of the Interim Measures undertaken at the facility and identifies any significant changes made to the design in response to conditions encountered during construction. Each Interim Measure is separately discussed below.

2. INTERIM MEASURE NO. 1 – STORMWATER DIVERSION

Stormwater from the slopes of Coldwater Mountain immediately above the South Landfill is collected in a channel constructed upgradient (i.e. upslope) of the landfill. The channel is approximately 2000 feet long and intercepts the stormwater which formerly flowed over the landfill. The major features of this diversion system are as follows:

- In cross section, the channel consists of a downstream berm of compacted, engineered fill with an average height of approximately 15 feet above the surrounding ground surface and a crest width of 10 feet. The channel itself has a bottom width of 10 feet and a maximum ponded depth of 13 feet, except in the vicinity of the principal spillway.
- The channel was constructed with both principal and emergency spillways. The principal spillway, located on the western side of the channel, consists of a concrete inlet structure and a 24 inch ductile iron pipe, which passes under the downstream berm and conveys stormwater to an energy dissipater. The pipe and channel are sized to store a 50-year, 24-hour storm with an outlet flow rate of approximately 70 cfs. Stormwater runoff which exceeds this volume will spill over the berm through an emergency spillway located on the eastern end of the channel. The discharge from the emergency spillway will flow into a natural drainage channel which will convey the water to culverts under Highway 202 and from there into the existing Lower Detention Basin.
- Flow from the energy dissipater at the end of the principal spillway is carried down the slope of Coldwater Mountain in a 36 inch diameter welded high density polyethylene (HDPE) pipe into a second energy dissipating device on the south side of Highway 202. From there, it is conveyed under the highway by passing the pipe through the existing 4 ft. x 6 ft. box culvert on the west side of Clydesdale Avenue and is then carried in pipe under Clydesdale, through AOC B, into a discharge structure on the south side of Tenth Street.

With few exceptions, the diversion system was constructed as shown in the original design drawings presented in the Interim Measures Work Plan (IMWP). The exceptions consisted of the following:

- The original design specified the installation of circular manholes at regular intervals along the pipeline to permit cleanout. Square manholes (instead of circular) were used in two locations south of Highway 202 and in one location on the south side of Tenth Street. Also, 8-inch diameter HDPE cleanout risers were used instead of manholes at three locations between Clydesdale Avenue and Eighth Street.
- The original design envisioned that the 4 ft. x 6 ft. box culvert under Highway 202 would be sealed, with all stormwater runoff from the South Landfill being channeled into the Lower Detention Basin. This scenario would have required the creation of a small detention pond south of the highway, on the east side of the landfill, partially located on property not owned by Solutia. Solutia was unable to purchase this property and the design had to be revised to allow flow through the 4 ft. x 6 ft. culvert during a severe storm event. Under these conditions, discharge from the culvert will be captured at a headwall constructed on the east side of Clydesdale Avenue and conveyed to the discharge structure on the south side of Tenth Street. The flow from this structure is monitored under the facility NPDES Permit. The revised design will still channel the flow from anything less than a 50-year, 24-hour storm to the Lower Detention Basin, but will allow flow from a larger storm to pass through the culvert. The revised design was approved by the Alabama Department of Transportation.
- Construction of the diversion channel required the relocation of an access road to a Bell South microwave relay station at the top of Coldwater Mountain. The original design included the relocation of the road around the west side of the diversion channel; however, this would have required the construction of extensive side-hill fills on steep slopes. With the approval of Bell South, the design was revised to allow the new access road to be constructed across the berm and diversion channel, close to its original alignment.

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None of these changes affects the performance criteria used for the design of the diversion system. Consequently, none of the changes are considered to be significant. Construction details of the changes are provided in the as-built construction report to be submitted under separate cover.

3. INTERIM MEASURE NO. 2 – SOUTH LANDFILL CAP UPGRADE

This Interim Measure consisted of construction of a final cover system on the western half of the South Landfill. The upgrade of the cover system consists of two major components. The first component is the installation of a low maintenance, lightweight cap installed over the disposal cells in the eastern half of the landfill in order to reduce surface water infiltration and minimize transport of potentially affected soils. The second component is the installation of a soil cover system installed to reduce erosion of potentially affected surficial soils adjacent to the closed cells. An overview of the major activities associated with the cover system construction is presented below.

The cap consists of a 14 acre multi-layered geosynthetic cover constructed on top of the closed landfill cells and adjacent slopes. It includes the following components (from bottom to top):

- A 40 mil thick textured high density polyethylene (HDPE) geomembrane.
- A geocomposite drainage layer installed directly on top of the geomembrane to provide lateral drainage. The geocomposite consists of a geonet bonded to two layers of 8 oz/yd² nonwoven, needle-punched geotextile.
- A cover soil layer consisting of a minimum of 18 inches of soil to protect the geomembrane, sustain the root growth of nonwoody plants and provide adequate moisture retention.
- A topsoil layer, approximately 6 inches thick, applied on steep slopes to support vegetation. On flatter slopes, the compacted cover soils were tilled and then seeded.

The soil cover was constructed on approximately 11 acres outside of the limits of the geosynthetic cap. The area extends from the geosynthetic cap to the existing fence to the north, west and south and ties in to the western slope of the RCRA cell. The cover consists of a 6 oz/yd² needle punched, nonwoven geotextile installed directly on the native soil, overlain by a minimum of 12 inches of compacted soil. The geotextile serves as a marker layer for delineation between the cover and the

former soil surface, as well as for erosion protection. The upper few inches of the compacted cover soils were tilled and hydroseeded.

During construction, the only significant revisions to the original design were as follows:

- The limits of the cap were extended beyond the northeastern corner of the landfill to include an area of about two acres to allow for a more rounded toe of slope. This area includes three sumps associated with the groundwater Corrective Action System. Since these sumps will have to be modified or removed in the near future, an area approximately 50 feet square immediately above the sumps was left uncovered. This area will be covered once the sumps are modified or removed.
- The original design included ditches running transversely across the landfill side slopes as a means of minimizing erosion by surface water runoff. During construction, it was observed that the rate of erosion of the unprotected slopes was extremely small, despite the unusually high rainfall experienced in the last quarter of 1997. Consequently, it was clear that these ditches were not required and they were replaced with strips of erosion matting laid transversely across the slopes.

Neither of these changes adversely affects the performance of the cap and cover and, in fact, extension of the limits of the low permeability cap enhances the overall performance of the system.

4. INTERIM MEASURE NO. 3 – SOIL CONTAINMENT AND STORMWATER MANAGEMENT IN AOC B

4.1 Soil Containment

A cover was constructed on Solutia-owned property within AOC B east of Clydesdale Avenue. This area is approximately bounded by Highway 202 on the south, Clydesdale Avenue on the west, Montrose Avenue on the east, and the railroad tracks on the north. Within this overall area, a total of nine residential properties not owned by Solutia were excluded from the cover, as well as the Mars Hill Missionary Baptist Church. These properties are individually identified in the IMWP. The cover also excludes the commercial properties along Clydesdale Avenue and Tenth Street and the western portion of a commercial property between the railroad tracks and Tenth Street, east of Clydesdale Avenue. The extent of the cover was selected to include all of the sample locations on Solutia-owned property where PCBs were detected, unless such locations will be covered by other structures (e.g., a berm built in the vicinity of Eighth Street).

Prior to construction of the cover, all structures owned by Solutia were demolished and the entire area within the cover limits was cleared, with the exception of established mature trees. A 6-oz weight, continuous filament, needle punched, non-woven geotextile was then installed in cleared areas to define the boundary between the cover and the former soil surface. Over the geotextile, a minimum of 14 inches of soil cover was placed and was hydroseeded to establish a vegetative cover. The existing drainage ditch was covered by the same textile and backfilled to the original ground surface elevation. An HDPE geomembrane liner was then placed over the ditch area on Solutia-owned property and covered by the 14 in. thick soil cover.

The IMWP noted that the cover in the East Side would be constructed in two stages. The first of these was completed in 1997 and included the majority of the proposed cover. However, the area around Bethel Missionary Baptist Church could not be covered since the church was in use until the middle of December 1997. The church is now vacant, however, and will be demolished in the spring of 1998. The cover will be constructed in this area in the summer of 1998.

The soil cover in AOC B was constructed in accordance with the drawings and plans presented in the IMWP. The only revisions to the original design were minor, involving the HDPE geomembrane installed over the drainage ditch. The original design specified the use of a 40-mil thick HDPE liner at least 20 feet wide. Instead, approximately one-half of the ditch was covered with a composite HDPE/bentonite liner consisting of bentonite clay bonded to a 20-mil thick HDPE geomembrane. The composite liner provides the same low permeability as the 40-mil liner, while offering superior puncture and tear performance once the bentonite layer becomes hydrated. The minimum liner width was 27.

4.2 Stormwater Management

This Interim Measure results in the collection of stormwater flows and the conveyance of these flows in individual pipelines to the permitted NPDES discharge point on the south side of Tenth Street (DSN 012). In order to accomplish this, the following pipelines were constructed of welded HDPE:

- One 36 in. diameter line to convey stormwater from the Upper Diversion Channel. This pipeline was previously described in Section 2 of this report.
- One 36 in. diameter pipeline to convey runoff from the median of Highway 202 and from the drainage area immediately north of Highway 202 and west of Clydesdale Avenue, through AOC B, to the discharge structure on the south side of Tenth Street.
- Two 36 in. diameter pipelines constructed on the east side of Clydesdale Avenue to convey stormwater runoff from the plant to the new discharge structure on Tenth Street.
- One 18 in. diameter pipeline to convey the discharge from the existing Lower Detention Basin to the discharge structure south of Tenth Street.
- Runoff from AOC B within the area approximately bounded by Highway 202 on the south, Eighth Street on the north, Clydesdale Avenue on the west, and Montrose Avenue

on the east is collected behind a berm constructed in AOC B. Discharge from this drainage area is conveyed through the berm via a 24 in. diameter pipe, which carries the flow to the discharge structure on the south side of Tenth Street.

Flow from all pipelines is directed into a discharge structure on the south side of Tenth Street. A minor modification has been made to the facility NPDES Permit to designate this structure as monitoring point DSN 012. Discharge from this structure is carried under Tenth Street into a new channel constructed north of Tenth Street and is conveyed in open channel to the existing culvert under the railroad tracks.

With one exception, the pipelines, energy dissipaters and discharge structures were constructed as originally designed. The exception is that three manhole structures between Clydesdale Avenue and Eighth Street were replaced with 8 inch diameter cleanout risers. These risers still allow access to the pipelines for cleaning and do not affect the performance of the system.

5. INTERIM MEASURE NO. 4 – SEWER SYSTEM UPGRADE

All non-contact process water from the plant has been diverted from the in-plant sewer system. The water is now discharged to the in-plant waste water treatment facility and is then discharged to the Anniston Publicly Owned Treatment Works. Thus, only stormwater currently flows through these sewers.

The interiors of all of the major sewer lines which discharge to the outfall designated as DSN 001 in the facility NPDES permit were videotaped with a remotely operated video camera and, for the most part, were found to be in serviceable condition with only minor blockages. The investigation revealed that the majority of the flow at DSN 001 is contributed by a 36 inch diameter trunk sewer, which runs from the outfall, diagonally across the plant, to the southwestern corner of the property. The videotapes also revealed that the majority of the smaller diameter collector pipes discharging into the trunk line were dry or blocked, and could be safely abandoned.

Because the trunk sewer was in good condition, lining the existing pipe, rather than replacing it, proved to be feasible. Accordingly, an *in situ* lining was constructed in the trunk line using a proprietary product and process called Cure Line®. The process uses an epoxy resin-impregnated felt liner and, after drying, results in a hard, durable, impermeable lining which is in intimate contact with the sewer pipe along its entire length. The manholes along the trunk sewer were lined with the same material and, consequently, seepage into any annular space which may exist between the pipe and the lining is trapped. Similarly, the few cutouts that were required in the lining to allow collector lines to discharge into the trunk line were constructed in such a way as to preclude seepage between the pipe and the liner. The sewer was videotaped after construction to ensure that the lining was continuous throughout its length.

At this time, the base flow at the discharge point DSN 001 is minimal and is being contributed by groundwater seepage into two or three collector pipes. These pipes discharge into the trunk line and investigations are currently underway into the possibility of sealing these collectors.

6. INTERIM MEASURE NO. 5 – SOIL CONTAINMENT NORTH OF PLANT

A Supplemental Interim Measures Work Plan was submitted to ADEM on December 23, 1997 which described the conceptual design of the measures to be constructed to contain soils and sediments downgradient of the West End Landfill. Designs for these measures are currently being finalized and it is anticipated that the final design drawings will be submitted to ADEM by April 15, 1998.

In summary, the planned Interim Measures include the following major elements:

- Collection of stormwater flowing under the railroad tracks and conveyance of the collected water in a 42 inch diameter HDPE pipe to an existing culvert which runs along the north side of West Tenth Street. Stormwater in the culvert flows to the east under Clydesdale Avenue and discharges into a drainage ditch which runs along the north side of the railroad tracks and is tributary to Snow Creek.
- Construction of a low berm in the northeast portion of the Solutia-owned property to create a small retention pond for stormwater storage during periods of high precipitation.
- Construction of a soil cover on Solutia-owned property in those areas where testing has shown the surficial soils to be affected. The cover will be identical to that constructed in the East Side for Interim Measure No. 3 (refer to Section 4.1 of this report).

Construction of this Interim Measure will begin in June 1998.

7. REPAIRS AND MODIFICATIONS TO GROUNDWATER INSTALLATIONS

During construction, the protective casings on a number of monitoring wells and piezometers were damaged by heavy equipment and one well (OW-6) was destroyed. This well has been replaced and the protective casings are currently being repaired. With the exception of OW-6, none of the damage was serious enough to jeopardize the integrity of the monitoring wells.

The discharge lines from the groundwater Corrective Action Systems on the South Landfill were also cut during construction. The lines were repaired and the Corrective Action Systems restarted.

Finally, approximately 17 monitoring wells and piezometers, as well as three interceptor wells, were modified prior to construction of the Interim Measures. Modifications consisted of extending the well risers to provide a minimum height of two feet above the post-construction ground surface and the installation of new protective casings. Details of the modifications were approved by ADEM.

8. AS-BUILT AND CERTIFICATION REPORTS

As noted in Section 1 of this report, an as-built construction report and a certification report for the upgrade to the South Landfill cap are currently being prepared. These reports will contain details of the as-built configuration of the Interim Measures, as well as all of the quality control testing performed during construction. It is anticipated that these reports will be submitted to ADEM by April 30, 1998. In addition, copies of the final design drawings, which incorporate all of the design revisions made subsequent to submission of the IMWP, will be submitted by April 10, 1998.

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9. SCHEDULES

Construction of Interim Measures Nos. 1, 2, 3, and 4 was substantially completed by December 31, 1997, as originally scheduled in the IMWP. A Supplemental Work Plan for Interim Measure No. 5 (soil containment downgradient of the West End Landfill) was also submitted prior to that date, again as required by the IMWP. As noted in Section 6 of this report, construction of this Interim Measure will begin in June 1998.