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May 30, 2006

INTERIM REMEDIAL MEASURE PLAN FOR THE CLOSED LANDFILL

Rensselaer Facility
Rensselaer, New York

Prepared for:

BASF CORPORATION
100 Campus Drive
Florham Park, New Jersey 07932

Remedial Engineering, P.C.
Environmental Engineers

and ROUX ASSOCIATES, INC.
209 Shafter Street, Islandia, New York 11749 ♦ 631-232-2600

TABLE OF CONTENTS

FIGURES

APPENDICES

1.0 INTRODUCTION

On behalf of BASF Corporation (BASF), Remedial Engineering, P.C., (Remedial Engineering) and Roux Associates, Inc., (Roux Associates) have prepared this Interim Remedial Measure (IRM) Plan for the Closed Landfill (Landfill) portion (Site Code 442004) of the inactive BASF Rensselaer Facility (Site) in Rensselaer County, New York (Figures 1, 2 and 3). This IRM Plan addresses the excavation and offsite disposal of soil in the northern (referred to as Areas 1A and 1B on Figure 4), central, and south-central portions of the Landfill (referred to as Areas 2A through 2E on Figure 5) that have been found to contain high concentrations of volatile organic compounds (VOCs). These areas are collectively referred to as "elevated VOC areas".

The IRM described in this Plan is part of the remedial action that is being performed pursuant to the Voluntary Cleanup Agreement for the Landfill between the New York State Department of Environmental Conservation (NYSDEC) and BASF. This IRM Plan has been submitted in accordance with NYSDEC procedures set forth in Technical and Administrative Guidance Memorandum (TAGM) #4042 and TAGM #4048, which defines IRMs and establishes a tracking procedure. The IRM described in this Plan is one component of the comprehensive remedy for the Landfill, which consists of installation of a multi-component Alternative Landfill Cover and creation of an integrated wildlife habitat. The evaluation of remedial alternatives and selection of the remedy are described in the Remedial Action Selection Report (RASR) (Roux Associates, 2005). The remedy was approved by the NYSDEC on April 26, 2006.

1.1 Objectives and Summary of Selected Remedy

The objective of this IRM is the removal and offsite disposal of soil, waste, and debris (collectively referred to as waste materials) from elevated VOC areas within the footprint of the Landfill (Figure 3). The limits of the elevated VOC areas to be remediated are shown on Figures 4 and 5 (Roux Associates, 2005).

The work to be performed under this IRM Plan is one component of the comprehensive remedy for the Landfill. Following completion of this IRM, the remaining components of the remedy will be implemented:

- An Alternative Landfill Cover consisting of a 6- to 12-inch common fill grading layer, a biota barrier, a 12-inch low permeability soil layer, a 12-inch planting substrate layer, and a 6-inch topsoil layer. The alternative cover will:
  - Provide a substrate and planting layer capable of supporting a diverse range of plant species to promote creation of a wildlife habitat.
  - Integrate phyto-technology plantings designed to reduce the infiltration of precipitation into the landfill material and remove groundwater from the subsurface.
  - Provide a barrier layer between the planting zone and underlying impacted fill to prevent burrowing animals from contacting landfill material.
- Vegetated drainage swales to manage and direct surface water runoff to catch basins.
- A monitoring and maintenance program to maintain the effectiveness of the engineering controls.
- A deed notice in the form of an environmental easement as institutional control. The environmental easement will state that all construction will be prohibited within the limits of the Alternative Landfill Cover footprint and the Site will be restricted to industrial/commercial use (in accordance with current zoning).

A perimeter groundwater and leachate collection system is currently in place and operational. The collection system ensures that no migration of contaminated groundwater from the Landfill occurs.

The Work Plan for the remaining components of Alternative 3 will be submitted to the NYSDEC under separate cover.

The summary of the Site background, history, and previous investigations is provided in previous reports, most recently listed in the RASR.

The remainder of this IRM Plan is organized as follows:

- Section 2: Nature and Extent of Contamination
- Section 3: Scope of Work
- Section 4: IRM Plan Implementation Schedule
- Section 5: References

2.0 NATURE AND EXTENT OF CONTAMINATION

The nature and extent of groundwater and soil contamination in the Landfill was determined from the results of the groundwater and soil sampling discussed in the Conceptual Remedial Design Report for the Closed Landfill (Roux Associates, 2004) and summarized in Section 4.2 of the RASR. A statistical analysis using a variogram model was used to establish the excavation limits as described in Appendix A of the RASR.

The most frequently detected VOCs present at the highest concentrations are benzene, ethylbenzene, chlorobenzene, xylenes, and 1,2-dichlorobenzene. These five compounds are found at the highest concentrations in two areas of the Landfill:

- along the northern border of the Landfill and the northern portion of the Landfill south of Main Plant Area of Concern (AOC)-1 in the immediate vicinity of locations PE-A1-S-23 (sampled during post-excavation sampling for Main Plant AOC–1) and PE-A1-S-23-4 (sampled in April 2004 [Roux Associates, 2004]); and

- in the central to southern portion of the Landfill in the vicinity of previous soil borings LF-TP-5 and LF-TP-6 (sampled during the test trench investigation in February 2003 [Roux Associates, 2003]).

These locations are presented in Figure 4. Soil from these locations will be removed during performance of this IRM Plan.

3.0 SCOPE OF WORK

The Scope of Work for the Landfill IRM Plan will consist of the excavation and offsite disposal of waste materials containing elevated levels of VOCs from Areas 1A and 1B from the northern portion of the Landfill as shown on Figure 4, and Areas 2A through 2E from the central and south-central portions of the Landfill as shown on Figure 5.

In general, remedial activities for the IRM will consist of the following tasks listed below, which are further discussed in Sections 3.1 through 3.10:

- Preparation of remedial action project plans;
- Initial Site survey;
- Mobilization and work Site preparation;
- Implementation of a Site-specific Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP);
- Waste material excavation and mechanical screening;
- Stockpiling;
- Dewatering;
- Waste sampling, transportation, and offsite disposal;
- Backfilling; and
- Site restoration and demobilization.

Additional details for the implementation of the Scope of Work described herein will be provided in the Remedial Design, which will be submitted under separate cover. A list of the technical specifications and drawings prepared for the Remedial Design is provided in Section 3.11.

3.1 Preparation of Remedial Action Project Plans

The following remedial action project plans will be prepared prior to Remedial Contractor mobilization to the Site:

- Health and Safety Plan (HASP);
- Community Air Monitoring Plan (CAMP);

- Work and Waste Handling Plan (WWHP);
- Traffic Control Plan (TCP); and
- Construction Contingency Plan (CCP).

A brief description of each plan is provided below.

3.1.1 Preparation of a Site-Specific HASP

A Site-specific HASP, prepared in accordance with 29 CFR 1910 and 1926, is included as Appendix A. The HASP shall be available at the Site for the Remedial Contractor's reference and cover work associated with the remediation of the elevated VOC areas.

3.1.2 Preparation of a Site-Specific CAMP

A Site-specific CAMP, prepared in accordance with New York State Department of Health (NYSDOH) community air monitoring requirements, is included as Appendix B. The design of the CAMP is intended to provide a measure of protection for the downwind community from potential airborne contaminated releases.

While soil removal is occurring, VOCs and particulates will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary monitoring stations. Upwind concentrations will be measured to establish background conditions. All monitoring equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. All 15-minute readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will be recorded. If the action limits are exceeded, an Action Limit Report will be completed identifying the needs for engineering controls. In addition to the collection of VOC and particulate data, meteorological data consisting of wind speed, wind direction, temperatures, and barometric pressure will be collected. At a minimum, a full set of values will be collected at the start of each workday, noon of each workday, and the end of each workday. Readings will be utilized to position the VOC and particulate monitoring equipment in appropriate upwind and downwind locations.

3.1.3 Preparation of a Site-Specific WWHP

The Remedial Contractor will be required to prepare and submit a Site-specific WWHP. The work plan will contain, at a minimum, the following elements:

- Technical drawings;
- Detailed work schedule;
- Identification of all permits, approvals, licenses, notifications, etc. required to complete the work;
- Manpower, procedures and equipment and related quality to be used for the performance of the work, including but not limited to, the following activities: excavation, screening, stockpiling, sampling, loading out, equipment and personnel decontamination, storm-water runoff control, diversion, collection and disposal, dewatering, treating and disposing of construction wastewaters);
- Description of quality assurance/quality control (QA/QC) procedures; and
- Description of security operations.

3.1.4 Preparation of a Site-Specific TCP

The Remedial Contractor will be required to prepare and submit a Site-specific TCP. The TCP shall detail procedures for the provision of personnel and materials (i.e., traffic lanes, safety costs) as necessary to control traffic entering and existing the Site. The Remedial Contractor will ensure that these procedures comply with the requirements of the local police department.

3.1.5 Preparation of a Site-Specific CCP

The Remedial Contractor will be required to prepare and submit a Site-specific CCP. The work plan will contain, at a minimum, the following elements:

- Measures for unexpected severe weather conditions;
- Measures if particulate or VOC levels in ambient air at the property line exceed NYSDOH CAMP guidelines;
- Measures if temporary controls proposed do not properly control nuisance odors emanating from excavation, processing, or staging operations;
- Measures for unexpected spills; and
- Measures for stockpiles that are detected to be deteriorating or malfunctioning.

3.2 Initial Site Survey

A professional surveyor licensed in the State of New York will perform the initial Site survey. At a minimum, this survey will identify the following features:

- The limits of excavation for the elevated VOC areas and surrounding features within the work zone (e.g., utilities), which were previously defined in the RASR based on extensive pre-delineation sampling and a variogram statistical analysis; and
- All onsite utilities within the work zone, including but not limited to, groundwater collection trenches, groundwater monitoring wells, gas, electric, water, and other miscellaneous piping.

The limits of excavation were defined in the RASR and are shown in Figures 4 and 5.

3.3 Mobilization and Work Site Preparation

A project kick-off meeting will be conducted with the selected Remedial Contractor prior to the commencement of any intrusive activities. The Remedial Contractor will supply all labor (HAZWOPER certified) in accordance with Occupational Safety and Health Administration (OSHA) 1910.120 and materials required for the removal and disposal of waste materials. In addition, all necessary permits, insurance, bonds, and licenses required to commence all work will be obtained, and all fees necessary to obtain these permits will be paid. Site preparation activities will include the following tasks:

- Construction fencing will be installed to delineate the work zone, act as a work site security measure, and mark the truck loading and decontamination areas.
- A support area will be defined to accommodate all equipment so that the project will proceed safely and efficiently.
- A decontamination area will be created.
- A soil erosion and sedimentation control plan (SESCP) will be implemented.

Temporary construction of fencing and traffic barricades will be used to protect all work areas. Prior to beginning work, the Remedial Contractor will field-verify and mark all utility locations with onsite BASF personnel. Utility and subsurface markings will be clearly visible to equipment operators and other personnel.

Soil erosion and sediment control measures will be in place prior to the implementation of the Landfill IRM Plan and will be maintained throughout the duration of all remedial construction

activities. These measures (e.g., hay bales, silt fences, etc.) will be used to protect any storm drains in proximity to any excavation area and to prevent the offsite migration of sediment and material excavated from the Landfill.

All sewer catch basins/drop inlets within the work area will be isolated and covered to prevent construction wastewater from entering the sewer system.

3.4 Implementation of the Site-Specific HASP and CAMP

All remedial activities will be performed in a manner consistent with 29 CFR 1910 and 1926. During all phases of Site work, the Remedial Contractor will, at a minimum, perform the following:

- Monitor health and safety conditions and fully enforce the Site-specific HASP (Appendix A) in addition to its own health and safety requirements.
- Ambient air will be monitored and sampled throughout the course of the work by the Engineer to evaluate particulate and VOC concentrations relative to action levels defined in the CAMP. During the course of the work, the Remedial Contractor will take abatement measures, as directed by the Engineer, to reduce the levels of particulates and VOCs at the limits of the work area to below the action levels defined in the CAMP.
- The Remedial Contractor will monitor all excavations for slope stability.
- The Remedial Contractor will be responsible for monitoring general Site conditions for potential safety hazards. Specifically, monitoring will be performed to verify that all requirements of OHSA as outlined in 29 CFR Part 1910 and 1926 are adhered to.

3.5 Waste Material Excavation and Mechanical Screening

As presented in the RASR, two areas within the northern portions of the Landfill (Areas 1A and 1B) and five areas within the central and south-central portions of the Landfill (Areas 2A, 2B, 2C, 2D and 2E) were identified for excavation and offsite disposal of waste materials containing elevated levels of VOCs. The extents of the excavation areas are shown on Figures 4 and 5, and the excavation depth will be either approximately eight feet below land surface or to the underlying silt/clay layer. A total of approximately 3,500 cubic yards (CY) of waste material will be removed as part of the Landfill IRM. If grossly contaminated soil is encountered along the perimeter of any excavation, the excavation will be expanded to remove the grossly contaminated soil.

Mechanical equipment will be used to excavate all waste materials encountered during the performance of the Landfill IRM. To the extent practicable, bulk waste and debris will be separated from more soil-like material and staged separately. Excavated soil containing significant amounts of debris and bulk waste that cannot be easily segregated will be mechanically processed at the discretion of BASF using a vibratory screener. This will facilitate the separation of debris and bulk waste from soil-like material and potentially comply with the requirements of the receiving disposal facility.

Once all excavation activities have been completed, final excavation depths will be field surveyed and confirmed by the field Engineer. Based on the extensive pre-delineation efforts already performed, as summarized in the RASR, post-excavation sampling will not be performed.

3.6 Stockpiling

Material removed from each excavation area will be stockpiled at one of the following distinct staging areas:

1. Unsaturated material staging area;
2. Saturated material staging area; and
3. Bulk waste and debris staging area.

The staging areas will be established within the Landfill area. The Remedial Contractor, with approval from BASF and the supervisory Engineer, will determine the specific location and configuration of the three staging areas. Stockpiles within each staging area will not exceed 500 CY in size.

The Remedial Contractor will provide a 40-mil high-density polyethylene (HDPE) liner for under the stockpile staging areas. If a staging area will be constructed on gravel, the Remedial Contractor will place a layer of sand or asphalt pavement prior to installing the HDPE liner to protect the liner from puncture. The staging areas will be constructed with a perimeter berm and sloped to a sump(s) as necessary to contain water and provide an area to remove water. The staging areas will be designed to provide discrete 500 CY stockpiles to allow dewatering and sampling activities to occur prior to loading and shipping of excavated materials for offsite

disposal. The staging areas and/or each stockpile will be covered with 10-mil HDPE liner to limit airborne migration of material, reduce odors, and prevent precipitation from contacting the staged material. The Remedial Contractor will inspect and maintain all stockpiles daily and following storms to detect any deterioration, malfunction, leaks, or presence of liquids, and correct such problems immediately. The Remedial Contractor will be responsible for installing, operating, and maintaining the staging areas so that they will remain in good condition throughout the implementation of the Landfill IRM.

All measures will be taken to limit the amount of dust generated during excavation. All excavations will be covered and protected following each day's work. The cover will be placed over the excavation in a manner that will prevent dust generation and be weighted sufficiently to prevent movement caused by wind. At the end of each day, the excavation will be protected using temporary fencing and other security measures to prevent unauthorized or inadvertent access.

3.7 Dewatering

Saturated soil removed from the excavation areas may require dewatering. Dewatering will be performed by stockpiling saturated soils within a bermed staging area that will allow for gravity drainage of entrained water into a temporary collection sump(s). The drained water will be pumped from the collection sump(s) to a temporary onsite holding tank for treatment and disposal at the onsite groundwater treatment system. All material dewatering will be within a range that will be specified in the technical specifications.

A paint filter test will be performed to verify the dryness and/or fixation of the saturated soil prior to offsite disposal. As necessary, drying/dewatering agents may be added to the saturated soil to eliminate free liquids prior to offsite disposal.

As necessary to achieve the final excavation depth, groundwater encountered in the excavation will be removed using a sump pump. Extracted groundwater will be temporarily stored in an onsite holding tank prior to treatment and disposal at the onsite groundwater treatment system.

3.8 Transportation and Offsite Disposal

The excavated soil-like material will be sampled for waste characterization prior to its removal from each respective staging area. A representative composite sample will be collected from each soil stockpile. Each composite sample will consist of five distinct, randomly-selected samples. The samples will be submitted in accordance with requirements of the approved disposal facility for waste characterization to a laboratory certified by the NYSDOH Environmental Laboratory Approval Program. For each sample, laboratory-supplied bottles will be filled using a dedicated polyethylene scoop, then placed on ice in a cooler for transport to the laboratory under standard chain of custody procedures.

The Remedial Contractor will remove and dispose contaminated soil in accordance with all applicable city, state and federal regulations and the BASF Waste Contractor Program. All waste materials will be shipped by a licensed hauler in accordance with the U.S. Department of Transportation guidelines as stated in 49 CFR, Parts 171 through 179, 6 NYCRR Part 364, and any other applicable state and local regulations. Before the transport vehicle leaves the staging area, the sides, undercarriage, and wheels will be inspected. If necessary, the transport vehicles will be pressure/steam washed to remove loose soil/debris in the decontamination area prior to leaving the Site.

If the results of the waste characterization testing determine that the waste is hazardous, it will be shipped under a hazardous waste manifest. All excavated material will be shipped to an appropriate facility; any hazardous waste will be shipped to a properly permitted offsite RCRA Subtitle C-permitted Treatment, Storage, and Disposal Facility (TSDF).

3.9 Fill Material Placement and Compaction

A New York State Department of Transportation approved backfill source will be identified. A composite sample of backfill materials will be obtained from the backfill source and analyzed at an offsite laboratory for VOCs, semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals (total analyses) and Toxicity Characteristic Leaching Procedure (TCLP) metals. BASF and the supervisory Engineer will compare the results of the analyses to the NYSDEC Recommended Soil Cleanup Objectives to evaluate the acceptability of the backfill source. Once

a fill source is approved, no substitute locations of fill material will be utilized without the approval of the NYSDEC.

For all excavation areas except Areas 1A, 2C and 2D, the backfill will be placed and compacted in 12-inch lifts up to surrounding grades. For excavation Area 1A, the clean fill material will be placed and compacted in 12-inch lifts up to approximately 2 to 2.5 feet below surrounding grades. For excavation Areas 2C and 2D, the clean fill material will be placed and compacted in 12-inch lifts up to approximately 1 foot below surrounding grade. The reason for not completely backfilling excavation Areas 1A, 2C, and 2D is to facilitate their incorporation into the final grade of the Alternative Landfill Cover. Grading details for the Alternative Landfill Cover will be provided in the 100% Remedial Design for the Alternative Landfill Cover scheduled to be submitted to the NYSDEC in 2006. Additional information regarding backfill and compaction will be provided in the technical specifications.

3.10 Site Restoration and Demobilization

Site restoration will consist of restoring the Site work areas in preparation for the construction of the Alternative Landfill Cover. Once the excavation and backfilling activities have been completed, all temporary facilities, temporary work zone barriers, soil erosion and sedimentation controls, and remedial construction equipment will be removed. The Remedial Contractor will then decontaminate all equipment in the established onsite decontamination area prior to each piece being shipped offsite.

3.11 List of Related Technical Specifications

The proposed list of technical specifications and drawings that are expected to be prepared as a companion document for contracting purposes is provided below.

- Division 0- Bidding Requirements
  - Supplementary Conditions
- Division 1- General Requirements
  - Summary of Work
  - Work by Others
  - Surveys and As-Built Drawings

- Work and Waste Handling Plan Requirements
- Water Management Requirements
- Construction Contingency Plan Requirements
- Project Meetings
- Submittals
- Construction Quality Assurance/Quality Control Plan Requirements
- Temporary Facilities, Site Preparation and Site Restoration
- Health and Safety Requirements
- BASF Confined Space Entry Requirements
- Temporary Controls
- Equipment Decontamination Requirements
- Source of Supply

- Division 2- Site Work
  - Site Clearing
  - Dewatering
  - Waste Material Excavation
  - Physical/Mechanical Screening
  - Staging and Loading of Excavated Materials
  - Waste Transportation and Disposal
  - Offsite Fill Materials
  - Material Placement and Compaction
  - Geotextiles
  - Geosynthetic Membrane
  - Planting
- Technical Drawings
  - Site Plan

- Excavation Plan
- Final Grading Plan
- Planting Plan
- Landfill Cover Sections
- Details I (General Remedial Construction Details)
- Details II (Soil Erosion and Sedimentation Control Details)

4.0 LANDFILL IRM PLAN IMPLEMENTATION SCHEDULE

The Landfill IRM Plan is anticipated to be performed from June 26 2006 through September 2006 (taking approximately 10 weeks to complete). The proposed schedule may be revised if the field tasks are delayed by inclement weather or availability of subcontractors. However, every effort will be made to adhere to the proposed schedule and the NYSDEC will be notified immediately if any changes are necessary. It is anticipated that the duration of major remedial construction tasks will be completed as follows:

- Initial Site Survey, Site Mobilization and Preparation – 1 week
- Waste Material Excavation and Removal – 4 weeks
- Transportation and Offsite Disposal – 2 weeks
- Fill Material Placement and Compaction – 2 weeks
- Site Restoration and Demobilization – 1 weeks

Respectfully submitted,

ROUX ASSOCIATES, INC.

Wai Kwan, Ph.D.
Project Engineer

REMEDIAL ENGINEERING, P.C.

Charles J. McGuckin, P.E.
Principal Engineer

5.0 REFERENCES

New York State Department of Environmental Conservation, 1991. Technical and Administrative Guidance Memorandum #4042. Interim Remedial Measures, Revised June 1, 1992.

New York State Department of Environmental Conservation, December 9, 1992. Technical and Administrative Guidance Memorandum #4048. Interim Remedial Measures – Procedures.

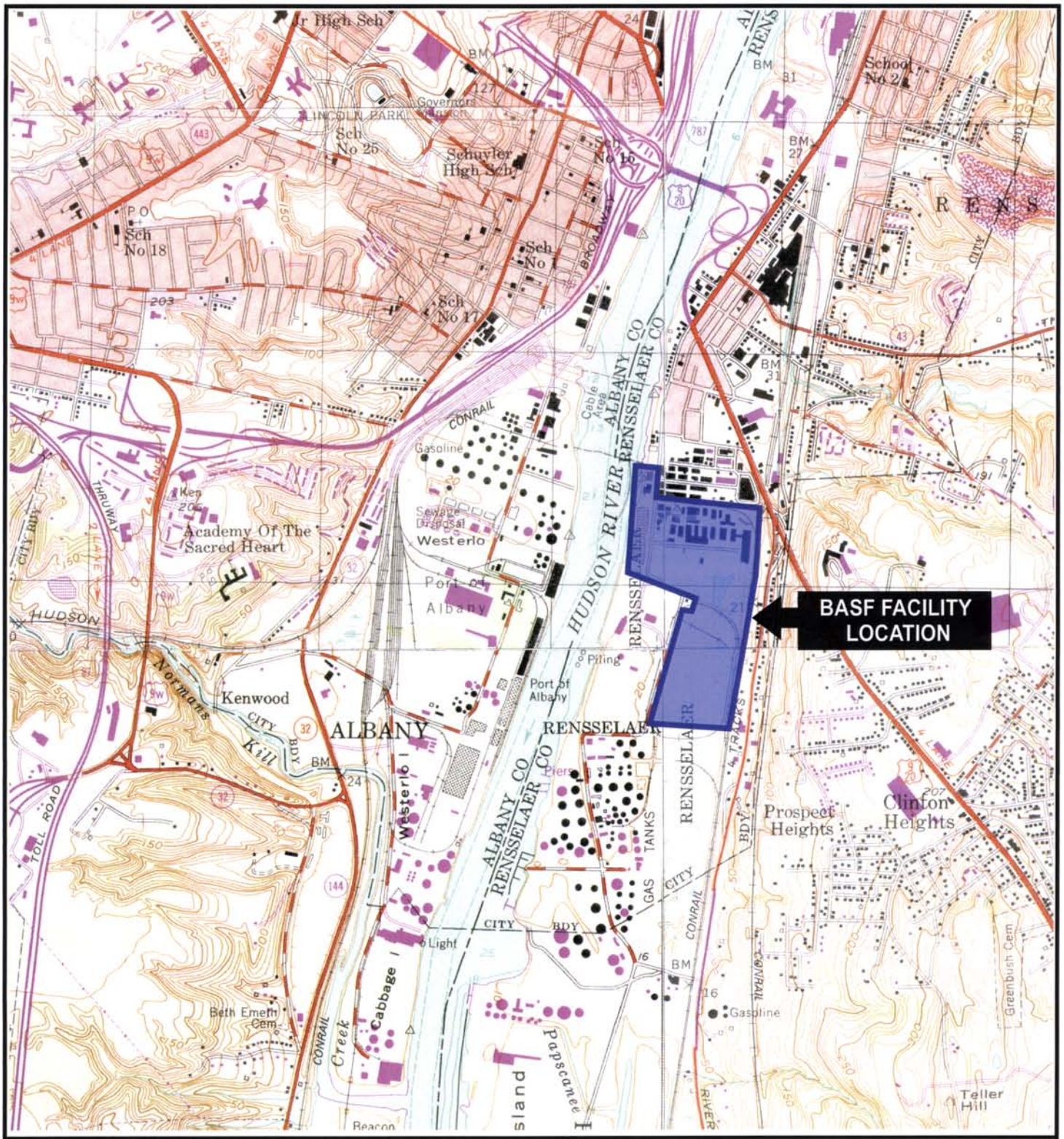
New York State Department of Environmental Conservation, June, 1998. Division of Water Technical and Operational Guidance Series No. 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

New York State Department of Environmental Conservation, April, 2000. April 2000 Addendum to June 1998 Division of Water Technical and Operational Guidance Series No 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

Roux Associates, Inc., February 4, 2003. Closed Landfill Trench Investigation, Rensselaer, New York.

Roux Associates, Inc., August 23, 2004. Conceptual Remedial Design for the Closed Landfill, Rensselaer, New York.

Roux Associates, Inc., October 3, 2005. Remedial Action Selection Report for the Closed Landfill, Rensselaer, New York.



QUADRANGLE LOCATION

SOURCE:
USGS; 1980. Albany, New York;
USGS; 1980. Troy South, New York
USGS; 1980. Delmar, New York
USGS; 1980. East Greenbush, New York
7.5 Minute Topographic Quadrangles

N

0 2000'

Title:

SITE LOCATION MAP

CLOSED LANDFILL INTERIM REMEDIAL MEASURE PLAN
BASF CLOSED LANDFILL, RENSSELAER, NEW YORK

Prepared for:
BASF CORPORATION
FLORHAM PARK, NEW JERSEY

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.	Date: 27APR06	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	1
Project Mgr.: O.R.	Office: NY	
File No.: BF1145601.CDR	Project No.: 25111Y27	

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AERIAL PHOTOGRAPH DATE : SPRING 2001

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Title:

SITE AREAS

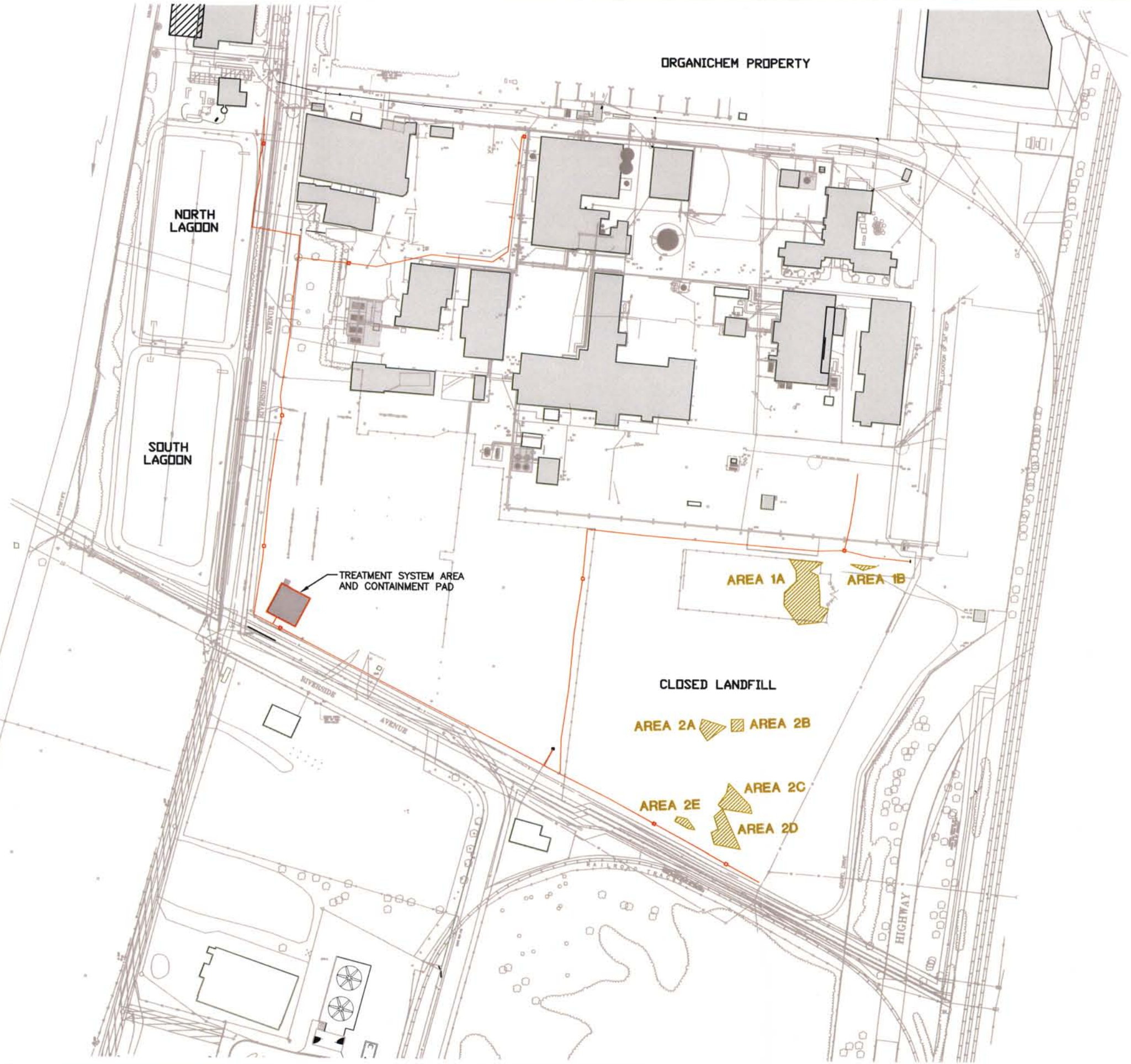
RENSSELAER, NEW YORK FACILITY

Prepared For:

BASF CORPORATION
FLORHAM PARK, NEW JERSEY

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: N.E.	Date: 4/25/06	FIGURE
Prepared by: N.E.	Scale: 1" = 450'	2
Project Mgr: N.E.	Office: NY	
File No: BF1145605.WOR	Project: 25111Y27	



LEGEND

LOCATION OF GROUNDWATER EXTRACTION AND DISCHARGE TRENCHES

PROPOSED EXCAVATION AREA

NOTES:

1. SURVEY INFORMATION PROVIDED BY C.T. MALE ASSOCIATES, P.C. 50 CENTURY HILL DRIVE, LATHAM, NY 12110.
2. NORTH ORIENTATION AND BEARING BASED ON MAP REFERENCE NO. 1.

MAP REFERENCES:

1. ALTA/ACSM LAND TITLE SURVEY LANDS NOW OR FORMERLY OF BASF WYANDOTTE, CORPORATION PREPARED FOR BESICORP–EMPIRE DEVELOPMENT, LLC, CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK, PREPARED BY C.T. MALE ASSOCIATES DATED JANUARY 31, 2001, DWG. NO. 01–114R.
2. TOPOGRAPHIC SURVEY LANDS NOW OR FORMERLY OF BASF WYANDOTTE, CORPORATION, PREPARED FOR BESICORP–EMPIRE DEVELOPMENT, LLC, CITY OF RENSSELAER, RENSSELAER COUNTY, NEW YORK, PREPARED BY C.T. MALE ASSOCIATES DATED JANUARY 28, 2001, DWG. NO. 01–109.
3. RECORD SURVEY OF GCS AREAS 2, 3, 4, 5, 6 AND 7 PREPARED FOR OBRIEN AND GERE ENGINEERS, INC., PREPARED BY C.T. MALE ASSOCIATES P.C., DATED MARCH 20, 2006, DWG NO. 03–450. MODIFICATIONS TO GCS AREA 3 IN 2004 ARE BASED ON FIELD MEASUREMENTS PROVIDED BY O'BRIEN AND GERE OF NORTH AMERICA, INC. IN FEBRUARY 2005.

N

200' 0 200'

Title:

SITE PLAN

CLOSED LANDFILL INTERIM REMEDIAL MEASURE PLAN
BASF CLOSED LANDFILL, RENSSELAER, NEW YORK

Prepared For:
BASF CORPORATION
FLORHAM PARK, NEW JERSEY

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.	Date: 25APR06	FIGURE
Prepared by: B.H.C.	Scale: 1" = 125'	3
Project Mgr: O.R.	Office: NY	
File No: BF1145602	Project: 25111Y27	

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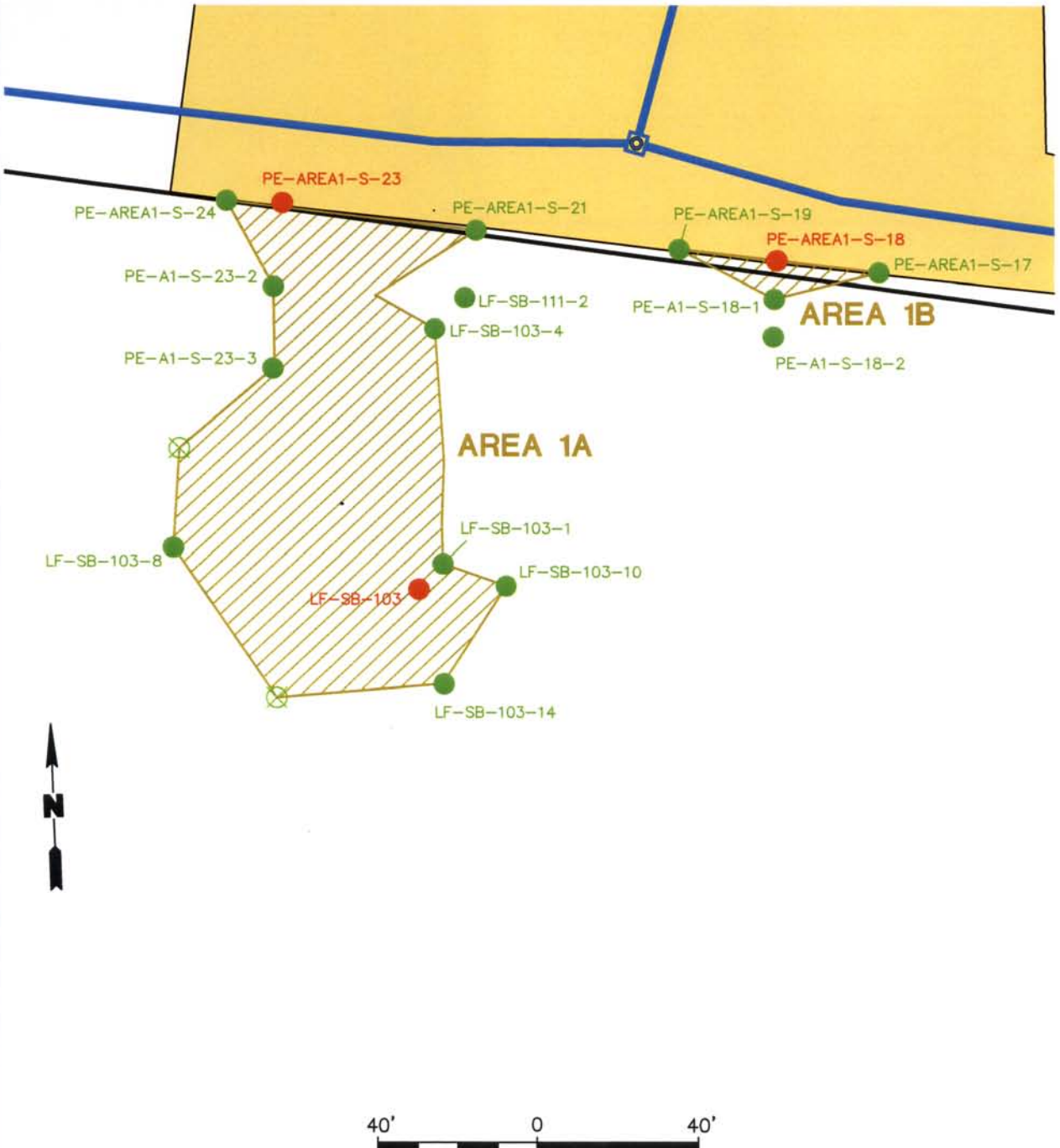


LEGEND

- PROPOSED EXCAVATION AREAS
- LF-SB-103 — LOCATION AND DESIGNATION OF SOIL SAMPLE WITH BENZENE GREATER THAN 12,000 UG/KG OR CHLOROBENZENE GREATER THAN 340,000 UG/KG
- LF-TP-1 — LOCATION AND DESIGNATION OF SOIL SAMPLE WITH BENZENE LESS THAN OR EQUAL TO 12,000 UG/KG OR CHLOROBENZENE LESS THAN OR EQUAL TO 340,000 UG/KG
- LIMITS OF PROPOSED EXCAVATION BASED ON VARIOGRAM ANALYSIS PROVIDED IN REMEDIAL ACTION SELECTION REPORT.
- AOC-1 (PREVIOUSLY EXCAVATED AND BACKFILLED WITH CLEAN SOIL TO 1 FOOT BELOW THE WATER TABLE DURING THE SOIL IRM)
- BOUNDARY OF CLOSED LANDFILL
- EXISTING GROUNDWATER COLLECTION TRENCH

UG/KG – MICROGRAMS PER KILOGRAM

Title:

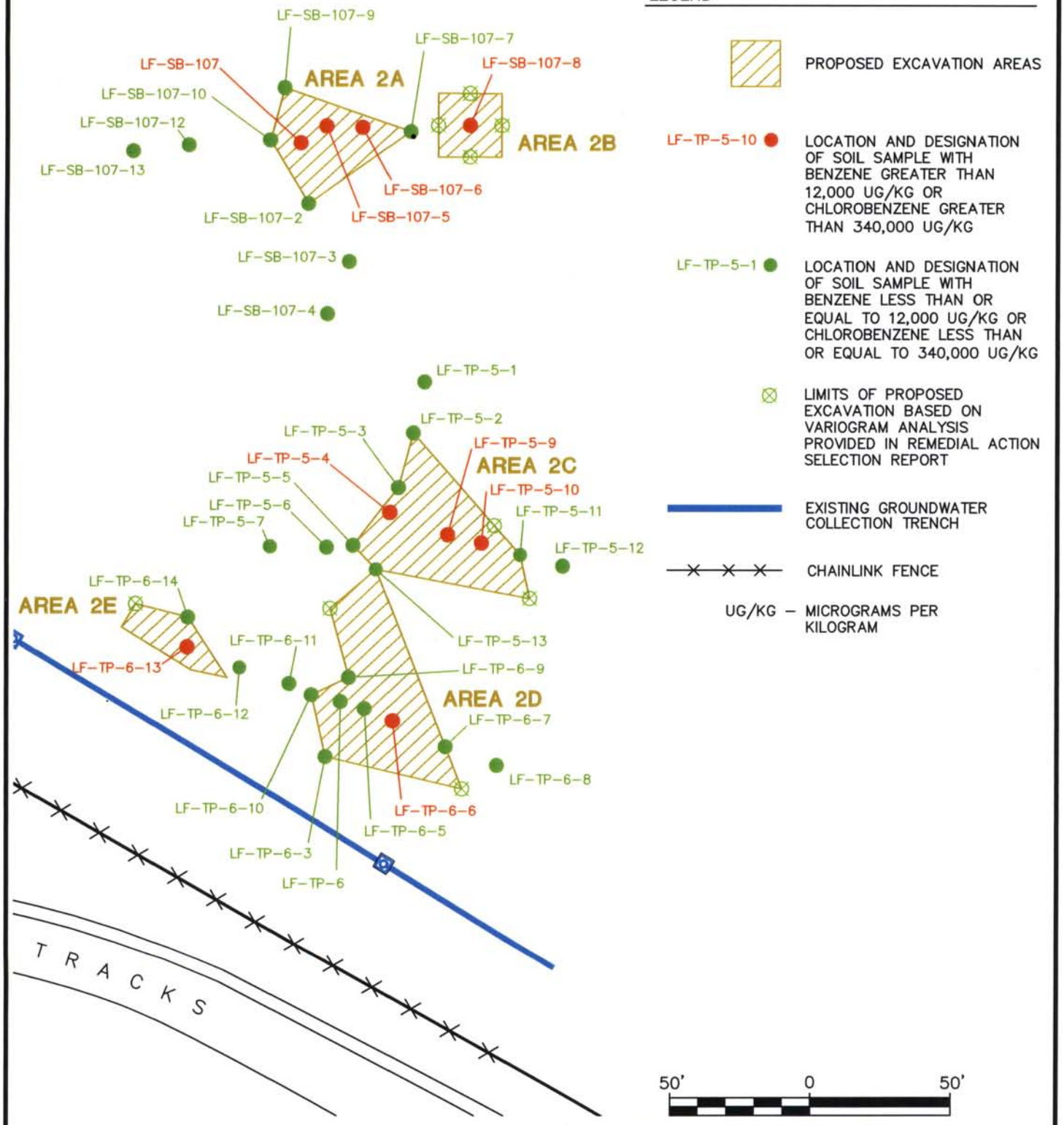
LIMITS OF EXCAVATION FOR AREAS 1A AND 1B

CLOSED LANDFILL INTERIM REMEDIAL MEASURE PLAN
BASF CLOSED LANDFILL, RENSSELAER, NEW YORK

Prepared For:
BASF CORPORATION
FLORHAM PARK, NEW JERSEY

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.	Date: 27APR06	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	4
Project Mgr: O.R.	Office: NY	
File No: BF1145603	Project: 25111Y27	



Title:

LIMITS OF EXCAVATION FOR AREAS 2A, 2B, 2C, 2D AND 2E

CLOSED LANDFILL INTERIM REMEDIAL MEASURE PLAN
BASF CLOSED LANDFILL, RENSSELAER, NEW YORK

Prepared For:
BASF CORPORATION
FLORHAM PARK, NEW JERSEY

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: W.K.	Date: 27APR06	FIGURE
Prepared by: B.H.C.	Scale: AS SHOWN	5
Project Mgr: O.R.	Office: NY	
File No: BF1145604	Project: 25111Y27	

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APPENDIX A

Health and Safety Plan

May 30, 2006

HEALTH AND SAFETY PLAN
ALTERNATIVE LANDFILL CLOSURE

Rensselaer Facility
Rensselaer, New York

Prepared for

BASF CORPORATION
100 Campus Drive
Florham Park, New Jersey 07932

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TABLE OF CONTENTS

TABLE OF CONTENTS

(Continued)

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

On behalf of BASF Corporation (BASF), Roux Associates, Inc. (Roux Associates) has prepared this site-specific Health and Safety Plan (HASP) in accordance with the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operation and Emergency Response Standard (29 CFR 1910.120 and 1926.65) and other OSHA requirements for job safety and health protection, and our Standard Operating Procedures (SOPs). In addition, various guidance documents were also consulted in preparing this HASP, including the National Institute for Occupational Safety and Health's (NIOSH) Occupation Safety, Health Guidance Manual for Hazardous Waste Site Activities, and the OSHA Job Safety and Health Protection Poster (Appendix A). This HASP addresses the work associated with remediation and closure of the Landfill area of the BASF facility located in Rensselaer, New York (Site) and will be implemented by the designated Site Health and Safety Officer (SHSO) during Site work. The HASP attempts to identify all potential hazards at the Site; however, Site conditions are dynamic and new hazards may appear constantly. Personnel must remain alert to existing and potential hazards as Site conditions change and protect themselves accordingly.

Compliance with this HASP is required for Roux Associates personnel who enter this Site. Assistance in implementing this HASP can be obtained from the Roux Associates Office Health and Safety Manager (OHSM). The content of this HASP may undergo revision based upon additional information made available. Any changes proposed must be reviewed and approved by the Roux Associates OHSM or his designee and documented on the Field Change Request form included as Appendix B. Key Roux Associates personnel involved with this project include the following.

Responsibility	Name	Telephone Number
Project Principal	Charlie McGuckin, P.E.	(631) 232-2600
Project Manager	Dana Bulcock	(631) 232-2600
Office Health and Safety Manager	Joseph Gentile, CIH	(856) 423-8800/ (610) 844-6911
Site Health and Safety Officer	Dana Bulcock	(631) 232-2600

1.1 Scope of Work

The scope of work will include the following tasks:

- soil excavation from the Landfill and backfilling;
- dewatering the excavations as necessary;
- waste characterization sampling for disposal; and
- grading of the Landfill including installation of ponds, swales and vegetative cover.

1.2 Emergency Contacts

Type	Name	Telephone Numbers
Police	Rensselaer Police	911
Fire Department	Rensselaer Police (dispatches)	911
Hospital (see Figure 1)	Albany Medical Center	(518) 262-3125
Poison Control Center	Poison Control Center	(800) 876-4766
Emergency Response	Rensselaer Police (dispatches)	911
Ambulance	Rensselaer Police (dispatches)	911
Police Non-Emergency	Rensselaer Police	(518) 462-7451
Fire Department Non-Emergency	Rensselaer Pumper #2	(518) 465-3243

Environmental Emergency (e.g., release or spill)

Contact	Name	Telephone Numbers
Project Principal	Charlie McGuckin, P.E.	(631) 232-2600
Project Manager	Dana Bulcock	(631) 232-2600
Office Health and Safety Manager	Joseph Gentile, CIH	(856) 423-8800/ (610) 844-6911
Site Health and Safety Officer	Dana Bulcock	(631) 232-2600
National Response Center		(800) 424-8802
BASF Site Contact	Wayne St. Clair	(518) 465-6534

Note: Roux Associates personnel will be equipped with a mobile telephone.

(Additional emergency information is provided in Section 13.0).

2.0 HEALTH AND SAFETY PERSONNEL RESPONSIBILITIES

2.1 Office Health and Safety Manager

The OHSM serves in assuring that the policies and procedures of this HASP are implemented by the SHSO. The OHSM provides guidance regarding the appropriate monitoring and safety equipment and other resources necessary in implementing the HASP.

2.2 Site Health and Safety Officer

The SHSO will be onsite during oversight activities and intrusive field operations. The SHSO is responsible for health and safety activities and has the authority to make related decisions. The determination of hazard levels will be made by the SHSO. The SHSO has stop-work authorization, which he or she will execute upon determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation such as detrimental weather conditions. Authorization to proceed with work will be issued by the OHSM in consultation with the Project Principal (PP) or his/her designee, e.g., Project Manager (PM). The SHSO or PP will contact emergency facilities and personnel when appropriate. Alternate SHSOs may be designated by the SHSO, if required, but must be pre-qualified and approved by the OHSM.

2.3 Project Principal

The PP is responsible for defining the overall project objectives (field and office related activities) determining chain-of-command, evaluating program outcome, and serves as final technical review of deliverables. For Roux Associates, the PP is ultimately responsible for overall Site activities including health and safety issues. The day-to-day management of health and safety issues is the responsibility of the PM. The SHSO, OHSM, PM, and PP shall consult and make an agreeable determination should Site information or unforeseen circumstances indicate a change in field procedures may be warranted. Changes to this HASP must be made by formal addendum and be approved by the PP, PM, OHSM, and SHSO.

2.4 Project Manager

The PM is responsible for day-to-day activities associated with his/her project including health and safety. Because there may be more than one PM for a site (for example, a Remedial PM and a Site Investigation PM), each PM must ensure that the HASP addresses the hazards associated with each phase of the project and is appropriate for the current specified scope of work. The

PM ensures that all Roux Associates personnel designated to work onsite are qualified according to applicable United States Environmental Protection Agency (USEPA), OSHA, and New York State requirements. The PM is responsible for ensuring that a duplicate office copy of this HASP is placed in the central project files. The PM is also responsible for ensuring that all required signatures are in place prior to implementing fieldwork.

2.5 Field Crew Personnel

All field crew personnel are responsible for reporting unsafe or hazardous conditions to the SHSO. All field personnel (including the above listed personnel) are responsible for understanding and complying with this HASP.

3.0 SITE HISTORY AND PHYSICAL DESCRIPTION

The BASF Rensselaer facility is located in an industrial area of Rensselaer, Rensselaer County, New York. The facility consists of an approximately 80-acre parcel of land that is separated into three areas commonly referred to as the Main Plant (including the wastewater treatment lagoons), South 40, and Closed Landfill. Each one of these three areas is listed separately in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites.

The Site is a vacant grassy field approximately five acres in size located to the south of the BASF Rensselaer Main Plant. The Site has been graded and slopes gently from the east and west to the center of the Site where there are several storm sewer grates. Surface elevations range from approximately 12 feet above mean sea level to approximately 18 feet above mean sea level. The northern Site boundary is partially fenced by a chain link fence enclosure used by contractors and partially open to the BASF Main Plant area. Main Plant features that immediately border the Site to the north include a paved former drum storage area, a decommissioned aboveground storage tank farm (87-TF), and the former location of the facility's warehouse (Building 89). Further to the north is the remainder of the BASF Main Plant with a chemical manufacturing facility (Organichem) and residential areas beyond. The BASF manufacturing facility has been closed since January 2001. A gravel access road and chain link fence surrounds the Site to the east, south, and west. A steep slope immediately to the east of the Site rises to the Port of Rensselaer Access Highway. This roadway was constructed in the 1990s and crosses over three sets of railroad tracks immediately to the north of the Site. A portion of the Port of Rensselaer Access Highway was constructed over several acres of the historic landfill footprint. To the south of the Site is one set of railroad tracks accessing a nearby cogeneration plant with the BASF South 40 area beyond. The BASF Main Plant's parking lot is located to the west with Riverside Avenue, the Lagoon area, and the Hudson River beyond.

The area that became the Closed Landfill was owned by multiple corporate entities and was also under United States government control for a period during World War II. Process wastes from the adjoining Main Plant were placed into the landfill until BASF assumed ownership of the Site in 1978. Historic aerial photos of the northern portion of the landfill adjoining the former drum storage area of the Main Plant indicate that this area consisted of trenches and ponds that presumably received liquid wastes.

In February 1978, applications to construct and operate a solid waste facility were submitted by GAF Corporation to the New York State Department of Environmental Conservation (NYSDEC). The waste stream indicated for this facility included industrial wastes such as spent iron reduction cakes, diatomaceous earth, activated carbon, tonsil clay (that included trace amounts of chlorobenzene and astrophloxine), "Nuchar" (wood-based activated carbon), broken laboratory glassware, used empty containers, demolition and construction debris, waste metal drums, waste fiber drums, polyethylene liners, lead sulfate, chromium hydroxide, zinc, zinc oxide, slurry with intermediate samples, waste laboratory solvents, dye samples, in-process samples, product samples, and discarded reagents in small quantities.

4.0 SITE-RELATED INCIDENTS, COMPLAINTS AND ACTIONS

Based on available information, there have been no incidents or complaints concerning this facility.

5.0 WASTE DESCRIPTION AND CHARACTERIZATION

Wastes may be encountered or generated during Site activities. Based on Roux Associates' Scope of Work, these wastes are anticipated to be characterized as follows:

- Waste Types

Liquid	☒	Solid	☒	Gas	☐
Sludge	☐	Semi-Solid	☐	Other (describe)	

- Waste Characteristics

Corrosive	☐	Toxic	☒	Flammable	☐
Volatile	☒	Carcinogen	☒	Radioactive	☐
Reactive	☐	Other (describe) _____			

For purposes of this HASP, toxic chemicals are those materials as defined by OSHA in Appendix A of 29 CFR 1910.1200. In general, toxicity is defined by OSHA on the basis of median lethal dose (LD50) or median lethal concentration (LC50) based upon the effects of the chemical in animal laboratory studies. A chemical is considered a carcinogen, as defined by Appendix A of OSHA in 29 CFR 1910.1200, if "(a) It has been evaluated by the International Agency for Research on Cancer (IARC) and found to be a carcinogen or potential carcinogen; (b) It is listed as a carcinogen or a potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or (c) It is regulated by OSHA as a carcinogen."

- Waste Containment

Pond	☐	Process Vessel	☐	Tank	☒
Lagoon	☐	Piping	☐	Lab	☐
Lake	☐	Drum	☒	Other	☐
Tank Car	☐	Soil Stockpile	☒	Describe: _____	

6.0 HAZARD ASSESSMENT

Chemical Hazards

The toxicological, physical, and chemical properties of compounds of concern with respect to the New York State Ambient Water Quality Standards are presented in Table 1. The compounds listed in Table 1 may pose a potential exposure hazard through ingestion, inhalation, injection or skin absorption, or a combination of these routes. These exposures will be minimized through the use of personal protective equipment (PPE), designated action levels based upon onsite air monitoring, and the assignment of experienced field personnel.

Chemical inhalation hazards will be monitored with the following instrument:

- photoionization detector (PID)
- Miniram Dust Monitor (Test pit investigation only)

Action levels for level of protection upgrades are discussed in Section 8.2.1.

Ambient Air Hazards

Potential exposure to impacted airborne particulates and to organic vapors. All personnel will remain up-wind as the task allows.

Heat/Cold Stress and Sun Exposure

Heat and cold stress are potential hazards associated with seasonal temperatures in Rensselaer, New York. Heat stress and cold stress symptoms, prevention, and treatment are described in Appendix C. Protection against sun exposure by wearing a sunscreen, hat, and long-sleeved shirts must be implemented when warranted.

Noise

Noise, associated with close proximity to operating heavy equipment, power tools, pumps, and generators. Personnel with 8-hour time weighted average (TWA) exposures exceeding 85 dBA must be included in a hearing conservation program in accordance with 29 CFR 1910.95. High noise operations will be evaluated by the SHSO. Noise exposure will be controlled through the use of hearing protection such as ear plugs or ear muffs or by maintaining set-backs from high noise equipment as warranted.

General Safety Hazards

- Heavy equipment and motor vehicle traffic. Workers shall wear fluorescent vests furnished with reflective strips at all times while working near motor vehicle traffic.
- Slip, trip, and fall hazards associated with uneven terrain, obstacles, and slippery or icy surfaces. General housekeeping will be performed to reduce slip, trip, and fall hazards.
- Sharp edges, broken glass, exposed nails, rusty metal.
- Pinch points.
- Overhead hazards (wear hard hats as applicable).
- Flying objects (i.e., rocks, debris) and airborne particulate hazards. Wear safety glasses, goggles, or face shields when appropriate.

Electrical Hazards

- Portable pumps, generators, and other power tools require proper grounding and/or a ground fault circuit interrupter (GFCI) before operation. Personnel should never attempt to move an operating pump or generator.
- Overhead and underground utility line.

Biological Hazards

Biological hazards include the possibility of snake bites, potentially rabid stray or wild animal bites, ticks or other insect bites, and bee and wasp stings. Ticks may carry lyme disease and/or rocky mountain spotted fever. Personnel shall examine themselves for ticks. Insecticides containing DEET may be an effective tick repellent. Personnel allergic to bee and/or wasp stings shall notify the SHSO of their condition and have medicine or antidotes to treat allergic reactions as prescribed by their personal physician available.

Other biological hazards include poison ivy, poison oak, and poison sumac. If exposed to these plants, wash skin thoroughly with soap and water.

7.0 TRAINING REQUIREMENTS

7.1 Basic Training

Site personnel who will perform work in areas where there exists the potential for toxic exposure will be health and safety trained prior to performing work onsite per OSHA 29 CFR 1910.120(e). Training records will be maintained by the onsite SHSO as described in Section 7.2.

7.2 Site-Specific Training

Training will be provided by the SHSO and Field Team Leader (FTL) that will specifically address the activities, procedures, monitoring, and equipment for the Site operations to Site personnel and visitors. The training will include Site and facility layout, hazards, emergency services at the Site, and will detail provisions contained within this HASP. This training will also allow field workers to clarify anything they do not understand and to reinforce their responsibilities regarding safety and operations for their particular activity. Site-specific training will be documented as part of the project records. There are no facility Health and Safety requirements currently in place. However, any facility Health and Safety requirements implemented in the future will be followed.

7.3 Safety Briefings

Project personnel will be given briefings by the FTL or SHSO on an as-needed basis to further assist them in conducting their activities safely. Safety briefings will be provided when new operations are to be conducted, changes in work practices must be implemented due to new information made available, and before work is begun at each project site. Records of safety briefings will be part of the project records.

7.4 Record Keeping Requirements

Record keeping requirements mandated by OSHA 29 CFR 1910.120 will be strictly followed. Specifically, all personnel training records, incident reports (Appendix D), and medical examination records will be maintained by Roux Associates for a period of at least 30 years after the employment termination date of each employee. The SHSO will maintain a daily written log of health and safety monitoring activities and monitoring results will become part of the project records.

8.0 ZONES, PROTECTION AND COMMUNICATIONS

8.1 Site Zones

The Scope of Work will be performed in level "D" PPE. Upgrading to Level C protection is not anticipated on this project. However, should the level of protection worn by field personnel be upgraded to level C, Roux Associates will employ a three-zone approach to Site operations to control the potential spread of contamination. Level D operation will not generally require segregated zones. The three zones to be employed when Level C is in use include:

- The Exclusion Zone;
- The Contamination Reduction Zone; and
- The Support Zone.

8.1.1 Exclusion Zone

The area(s) that contain or are suspected to contain hazardous materials will be considered the Exclusion Zone (EZ). This zone will be clearly delineated by a "Hotline." The "Hotline" is a length of colored flag tape completely surrounding the EZ. The SHSO may establish more than one restricted area within the Exclusion Zone when different levels of protection may be used or various hazards exist. Personnel are not allowed in the EZ without the following:

- a buddy;
- appropriate PPE;
- medical authorization; and
- training certification.

For purposes of this project, if Level C protection is required on this project, the EZ's Hotline will include, at a minimum, a 30-foot radius around all areas that contain or are suspected to contain hazardous materials. This area will be determined by the SHSO.

8.1.2 Contamination Reduction Zone

The Contamination Reduction Zone (CRZ) is established between the EZ and the Support Zone. The CRZ will contain the Contamination Reduction Corridor (CRC) and will provide for full personnel and portable equipment decontamination. The CRZ is used for general Site entry and egress, in addition to access for heavy equipment for investigation activities. The CRZ will also contain safety and emergency equipment (see Section 8.2.3). No personnel are allowed in the CRZ without:

- a buddy;
- the proper PPE;
- medical authorization; and
- training certification.

For purposes of this project, if Level C protection is required on this project, the CRZ will include a 20-foot radius area outside of the EZ.

8.1.3 Support Zone

The Support Zone (SZ) is considered the uncontaminated area and will be separated from the CRZ by the "Contamination Control Line." The "Contamination Control Line" will be a different colored flag tape than the "Hotline." The SZ will contain the support facility, which will provide for team communications and emergency response. At least one person will remain in the SZ at all times during operations downrange to facilitate communications and emergency response. Appropriate sanitary facilities and safety and support equipment will be located in this zone. The majority of Site operations will be controlled from this location, as well as Site access of authorized persons. The support facility will be located upwind of Site operations, if possible, and may be used as a potential evacuation point. No potentially contaminated personnel or materials are allowed in this zone except appropriately packaged/decontaminated and labeled samples and drummed wastes.

For purposes of this project, the SZ will include all areas outside of the CRZ.

8.2 Personal Protection

This section describes PPE and safety equipment to be used onsite.

8.2.1 General

Appropriate PPE shall be worn by Site personnel when there is a potential exposure to chemical hazards or physical hazards (e.g., falling objects, flying particles, sharp edges, electricity, noise) and as otherwise directed by the SHSO. The level of personal protection, type, and kind of equipment selected depends on the hazardous conditions and, in some cases, cost, availability, compatibility with other equipment, and performance. An accurate assessment of all these factors must be made before work can be safely carried out.

Roux Associates maintains a comprehensive written PPE program that addresses proper PPE selection, use, maintenance, storage, fit, and inspection. PPE to be used at the Site will meet the appropriate American National Standards Institute (ANSI) standards and the following OSHA (General Industry) standards for PPE.

- head protection – 29 CFR 1910.135;
- eye and face protection – 29 CFR 1910.133;
- respiratory protection – 29 CFR 1910.134;
- hand protection – 29 CFR 1910.138;
- foot protection – 29 CFR 1910.136; and
- protective clothing – 1910.132, 1910.120.

The level of protection to be worn by field personnel will be defined and controlled by the SHSO in conjunction with the PP or his/her designee. Where more than one hazard area is indicated, further definition will be provided by review of Site hazards, conditions, operational requirements, and by monitoring at the particular operation being conducted. Any upgrades or downgrades must be immediately communicated to the PP or his/her

designee. The anticipated PPE level of protection for Site tasks are listed below.

Task	Level of Protection
Excavation of soils and backfilling	Level D
Collection of waste characterization Samples	Level D
Dewatering of excavations as necessary	Level D
Site grading including installation of ponds, swales and vegetative cover	Level D

Respiratory protection may be upgraded or downgraded by the SHSO in conjunction with the PP on the basis of action levels presented below:

Action Levels for Respiratory Protection (Total Organic Vapors)	
Total Organic Vapors in Breathing Zone (ppm)[(1)]	**Action**
≤5	No Action
>5 - <25	Level C or Cease Work Until Level Drops
≥25	Cease Field Operations

[(1)] Based on relative response (sensitivity of PID to total organic vapors).

If the PID measurements are above five ppm but below 25 ppm and above background for five minutes in the breathing zone, employee protection will be upgraded to Level C with the use of a full-face respirator or work will cease until the relative measurements of VOCs are below 5 ppm.

If PID measurements exceed 25 ppm above background for five minutes in the breathing zone, work activities will cease until airborne vapor levels can be reduced to less than 25 ppm and are quantified or the SHSO determines alternate methods to be followed in order to proceed.

8.2.2 PPE Level Descriptions

The type of respiratory protection and clothing to be worn in each level of protection indicated above includes the following:

- Level D
  - Full-length pants and short-sleeved shirt, at a minimum. Long-sleeved shirt or coveralls as required.
  - Boots/shoes - chemical resistant with steel toes and shanks
  - Safety glasses
  - Hard hat (as required)
  - Chemical-resistant or cut-resistant gloves – depending on task
  - Hearing protection (as required)
  - Fluorescent Traffic Safety Vest w/ Reflective Strips (as required)
- Level C
  - Full-face, air-purifying, HEPA cartridge-equipped respirator (MSHA/NIOSH specifically approved for protection from organic vapors and particulates per OSHA 1910.1028)
  - Chemical-resistant clothing (coverall; hooded, two-piece chemical splash suit; chemical-resistant hood and apron; disposable chemical-resistant coveralls)
  - Gloves (outer), chemical-resistant - latex
  - Gloves (inner), chemical-resistant - nitrile
  - Boots (inner), chemical-resistant, steel toe and shank
  - Boots (outer), chemical-resistant (disposable)
  - Hard hat
  - Hearing protection (as required)

8.2.3 Safety Equipment

Basic emergency and first-aid equipment will be available at the work site, as appropriate. This may include HASP-specified communications, first-aid kit, emergency eyewash or emergency shower or drench system, fire extinguisher, and other safety-related equipment. Other safety

equipment will be located at the area of specific operations, e.g., excavating and sampling, as appropriate. Traffic cones or barricades and traffic vests will be used when work is required in high traffic areas.

8.3 Communications

Telephones - for communication with emergency support services/facilities. Roux Associates personnel will be equipped with a cellular telephone.

9.0 MONITORING PROCEDURES FOR SITE OPERATIONS

9.1 Monitoring During Site Operations

Air monitoring may be performed to verify that the proper level of equipment is used and to determine if increased protection or work stoppage is required. The following equipment may be used by Roux Associates onsite to monitor conditions:

- photoionization detector (PID)
- Miniram Dust Monitor

Section 8.2.1 lists the acceptable ranges for each piece of monitoring equipment above and the action levels for changes in respiratory protection. Monitoring equipment will be calibrated in accordance with the owner's manual.

9.2 Personnel Monitoring Procedures

Personal breathing zone samples, 8-hour, time-weighted average (TWA) sampling, may be conducted if sustained operations in Level C are required. The personal breathing zone samples will be collected according to NIOSH analytical methods and analyzed by an AIHA-certified laboratory.

9.3 Medical Surveillance Requirements

Medical surveillance specifies any special medical monitoring and examination requirements, as well as stipulates that all Roux Associates personnel and subcontractors are required to pass the medical surveillance examination or equivalent for hazardous waste work required by 29 CFR 1910.120. As a minimum, the examination will include:

- complete medical and work histories;
- urinalysis;
- physical exam;
- vision and hearing exam;
- blood chemistry;
- pulmonary function test; and
- audiometry.

The examination will be annual, at a minimum, and upon termination of employment with the company. Additional medical testing may be required by the OHSM in consultation with the company physician and the SHSO if an overt exposure or accident occurs, or if other Site conditions warrant further medical surveillance.

10.0 SAFETY CONSIDERATIONS FOR SITE OPERATIONS

Field activities will be performed under the level of personal protection described in Section 8.0. In this section, non-monitoring safety-related procedures are described.

10.1 Site Walk-Throughs

Safety considerations during Site walk-throughs precede all other field operations. The field team will maintain line of sight with each other at all times and regularly maintain communications with the Support Zone if utilized. Air monitoring will be performed as indicated in Section 9.0 and will be used to alert the walk-through team if a dangerous situation exists. Air monitoring will assist in prescribing levels of protection for future Site operations, designating Site layout, and identifying hazard areas, if any.

10.2 Heavy Equipment Safety

The SHSO will be present onsite during invasive operations such as excavation and will provide health and safety monitoring to ensure that appropriate levels of protection and safety procedures are followed by Roux Associates' personnel. Under no circumstances is anyone to enter the excavation. The proximity of chemical, water, sewer, and electrical lines will be identified by a utility mark-out service or a facility representative before any subsurface activity or sampling is attempted. The SHSO and PM shall confirm that the utility mark-out service has been notified at least 72 hours prior to earth disturbing activities.

The mechanical equipment used on any major construction site may also be used on a hazardous waste site. Typical machinery to be found includes pumps, compressors, generators, portable lighting systems, pneumatic tools (drum openers), hydraulic drum crushers, pug mills, fork lifts, trucks, dozers, backhoes, drill rigs, and Geoprobe® percussion probes. The equipment poses a serious hazard if not operated properly or if personnel near machinery cannot be seen by operators.

The following safe work practices will be followed during this task.

- The proximity of chemical, water, sewer and electrical lines will be identified by a utility mark-out service or a facility representative prior to beginning and subsurface activity.
- While excavating, stay out of reach of the backhoe arm's swing by standing at the end of the excavation, not near the sides (sides have the potential to cave in).

- The following maximum allowable slopes shall be maintained for the following conditions:

Maximum Allowable Slopes	
Soil or Rock Type	**Maximum Allowable Slopes (H:V)[1] for Excavations less that 20 Feet Deep[3]**
Stable Rock	Vertical (90°)
Type A[2]	¾ : 1 (53°)
Type B	1 : 1 (45°)
Type C	1½ : 1 (34°)

OSHA (29 CFR 1926.652, Subpart P, Appendices A and B)

Notes:

1 Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

2 A short-term maximum allowable slope of 1/2H : 1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H : 1V (53°).

3 Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Proper stockpiling, containment, and disposal practices will be followed in regard to the potential amount of waste generated during operations. The location of safety equipment and evacuation procedures will be established prior to initiation of operations according to this HASP. The use of hard hats, eye protection, ear protection, and steel-toed boots will be required during heavy equipment operations. Contaminated equipment will be placed on liner material when not in use, or when awaiting and during decontamination. Communications with the SZ will be regularly maintained.

10.3 Soil Sampling

Personnel must wear prescribed clothing, especially eye protection and chemical resistant gloves when sampling soils. Sample containers may be bagged prior to sampling to ease decontamination procedures. The sampling team must be aware of emergency evacuation procedures described in this HASP and the location of emergency equipment, including spill containment materials, prior to sampling. Contamination avoidance will be practiced at all

times. In some situations, additional monitoring by the SHSO may be needed to confirm or establish the proper level of protection before the sampling team can proceed.

10.4 Sample Handling

Personnel responsible for the handling of samples will wear the level of protection described in Section 8.2. Samples will be identified as to their hazard and packaged to prevent spillage or breakage. Any unusual sample conditions will be noted. Lab personnel will be advised of the sample hazard level and the potential contaminants present. This can be accomplished by a phone call to the lab coordinator and/or inclusion of a written statement with the samples. It may be necessary for the SHSO to review safety procedures in handling Site samples to assist or assure that these practices are appropriate for the type of suspected contaminants in the sample.

10.5 Waste Disposal

Waste disposal operations will be monitored by the SHSO and performed under the appropriate level of personal protection described in Section 8.2. Personnel will wear the prescribed clothing, especially eye protection and chemical resistant gloves, when handling or drumming waste materials. Contamination avoidance will be practiced at all times. Additional information on disposal procedures is described in Section 12.0.

10.6 Heavy Equipment Decontamination

If steam cleaner or pressure washer is used to decontaminate heavy equipment and associated tools, personnel will exercise caution during use. The high-pressure steam can cause severe burns. Protective gloves, face shields, hard hats, steel-toed boots, and Tyvek suits or rain gear must be worn when using steam cleaners or pressure washers.

10.7 Confined Space Entry

The scope of work does not require Roux Associates' personnel to enter confined space for this project. Any changes to the field activities that may necessitate confined space entry will be reported to the PP and OHSM. No Roux Associates personnel are permitted to make a permit required confined space entry. A permit required confined space is defined as any space, depression, or enclosure that has limited opening for entry and egress, may have limited ventilation, may contain or produce life-threatening atmospheres due to oxygen deficiency, the

presence of toxic, flammable, or corrosive contaminants, and which is not intended for continuous occupancy.

Examples of confined spaces prohibited from entry may include, but are not limited to, storage tanks, ventilation and exhaust ducts, stacks, pits, basements, silos, vats, vaults, pipes, and any topped open space four or more feet deep and not adequately ventilated.

10.8 Control of Hazardous Energy (LockOut/Tagout)

Hazardous energy at the Site will be controlled through the use of a lockout/tagout procedure developed in accordance with OSHA's lockout/tagout standard (29 CFR 1910.147). The purpose of lockout/tagout procedures is to minimize exposures to hazards from the unexpected energizing, startup, or release of residual or stored energy from equipment, machinery, or processes. Lockout/tagout procedures will be followed during the installation, servicing, and maintenance of machines or equipment that involve hazardous energy sources. Hazardous energy sources include any electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy source that is capable of causing injury to personnel.

Lockout/tagout procedures require the placement of a lock and/or tag on an energy isolating device (a device that physically prevents the transmission or release of energy such as manually operated electrical circuit breakers, disconnect switches, valves, and selector switches). After the energy isolation device is placed in the "off" or "safe" position, the lockout/tagout is placed on the energy isolation device to secure it in the "off" or "safe" position. This ensures that the equipment, machinery, or process is not capable of being operated while installation, servicing, or maintenance is taking place.

If it is determined that lockout/tagout procedures are required for any aspect of site work, the following generic lockout/tagout procedures will be implemented. Note, these procedures will be tailored to the specific application of a lockout/tagout if there is a need for same. Presently, there are no known situations that would require the application of lockout/tagout procedures at this Site.

1. Affected personnel and authorized personnel will receive lockout/tagout orientation training to become familiar with procedures to control hazardous energy. Affected personnel is defined as personnel whose job requires that they operate or use equipment,

machinery, or processes on which servicing or maintenance is being performed under lockout/tagout, or whose job requires them to work in an area in which such servicing or maintenance is being performed. Authorized personnel is defined as a qualified person to whom authority and responsibility to perform a specific lockout and/or tagout assignment has been given by the employer.

2. Before proceeding with the installation, maintenance, or servicing of any equipment, machinery, or process at the Site for which lockout/tagout procedures apply, a survey will be made to locate and identify associated energy isolation devices.

3. Once the survey is complete, the authorized personnel will notify all affected personnel, including the FTL and SHSO, that a shutdown of the equipment or machine will occur.

4. Following notification, the equipment or machine, if operating, will be shut down by normal stopping procedure (i.e., depress stop button, open toggle switch, turn light switch off, etc.).

5. Once turned off, the energy isolating device (i.e., circuit breaker, disconnect switch, valve, etc.) will be operated in such a manner that the machine or equipment will be isolated from the energy source (electrical, mechanical, hydraulic, pneumatic, chemical, thermal, etc.).

6. The energy isolating device is then "locked out" by applying the lockout, padlock, and tag to the device. In some cases, a chain must be used (in combination with a padlock) to sufficiently "lockout" a device (i.e., steam valve, hydraulic valve, etc.).

7. The tag will be filled out by the authorized personnel, indicating the personnel's name and the date and time of the lockout.

8. Once the energy isolating device has been locked out and tagged, all potentially hazardous sources or residual energy will be purged or dissipated (i.e., grounding, bleeding, venting, lowering, etc.).

9. After ensuring that no personnel are exposed, the authorized personnel will operate the normal operating controls to make certain the equipment will not restart. These operating controls must be returned to the "off" or "neutral" position after the test.

10. Use a volt meter to make sure that work is not energized, if applicable.

11. Attach a "ground stick" of sufficient size to handle any possible fault current to all three phases of the source, if applicable.

12. Maintenance or servicing of the machine or equipment can now be performed.

13. When the maintenance and/or service is completed, the work area is to be inspected to ensure that all affected personnel are safely positioned and/or removed. In addition, remove all nonessential items from the equipment.

14. The lockout, padlock, and tag shall then be removed from the energy, isolating device by the authorized personnel who applied the lockout devices.

15. Each and every personnel involved with the service or maintenance of the locked out equipment will place their assigned padlock to each and every lockout device and/or chain in such manner that if every other padlock were removed, the personnel would still have a padlock assuring that each and every source of energy is still "locked out". No personnel may affix the personal lockout/tagout device of another personnel.

16. If work on a piece of equipment of machinery that is locked out carries over to the next shift, the authorized personnel may remove their lockout device, provided that the next authorized personnel applies their lockout device at the same time the previous authorized personnel removes their lock device.

10.9 Hazard Communication

Personnel working at this Site have the right to know about the chemical hazards associated with hazardous materials used and stored onsite. This information will be readily available to all Site workers as required by OSHA's Hazard Communication Standard (29 CFR 1910.1200). This information will be communicated to personnel through the maintenance of a chemical inventory system, chemical labeling, material safety data sheets (MSDSs), hazard communication training, and a written hazard communication program.

Chemicals imported to the Site will bear the original Department of Transportation (DOT) required labeling on the chemical's container. In addition, a new label will be affixed to the original containers, if necessary, and to a new container to which the chemical is dispensed, providing the chemical name and specific hazard warnings (e.g., flammability, health, reactivity). Hazard warnings will follow either the National Fire Protection Association (NFPA) format or the Hazardous Material Information System (HMIS) format. Both systems are easy to use and rely on numerically ranking hazards on a 0 to 4 scale. Most chemicals used onsite, which are subject to the Hazard Communication Standard, are related to sampling activities. These chemicals may include hexane, methanol, acetone, and nitric acid.

10.10 Additional Safe Work Practices

Refer to the SHSO for specific concerns on each individual Site task. The safety rules listed below must be strictly followed:

- Use the buddy system when required.

- Practice contamination avoidance, both on and offsite.
- Plan activities ahead of time.
- Do not climb over/under obstacles.
- Be alert to your own physical condition.
- Watch your co-workers for signs of fatigue, exposure, heat or cold stress, etc.
- Report all accidents, no matter how minor, immediately to the SHSO.
- Do not eat, drink, chew gum, apply cosmetics, or use tobacco products while working onsite (except in the support zone).
- Be aware of traffic, heavy equipment, and other obstacles around you.
- Do not work onsite while under the influence of drugs or alcohol, including prescription drugs that may cause drowsiness.
- Copies of this HASP shall be readily accessible at all times.
- Note wind direction. Personnel shall remain upwind wherever possible during onsite activities.
- **READ AND SIGN YOUR HEALTH AND SAFETY PLAN BEFORE ENGAGING IN SITE ACTIVITIES.**

A work/rest regimen will be initiated when ambient temperatures and protective clothing cause a stressful situation. Work will not be conducted without adequate light or without supervision. Safety briefings may be held prior to beginning each task.

11.0 DECONTAMINATION PROCEDURES

11.1 Contamination Prevention

One of the most important aspects of decontamination is contamination prevention. Contamination prevention practices will minimize worker exposure and ensure valid sample results by precluding cross contamination. Procedures for contamination prevention include the following:

- For Personnel
  - do not walk through areas of obvious or known contamination;
  - do not handle or touch contaminated materials directly;
  - make sure all PPE has no cuts or tears prior to donning;
  - fasten all closures on suits, covering with tape, if necessary;
  - take particular care to protect any skin injuries;
  - stay upwind of airborne contaminants; and
  - do not carry cigarettes, gum, etc. into contaminated areas.
- Sampling/Monitoring
  - when required by the SHSO, cover instruments with clear plastic, leaving an opening for sampling and exhaust ports; and
  - bag sample containers prior to the placement of sample material.
- Heavy Equipment
  - care should be taken to limit the amount of contamination that comes in contact with heavy equipment;
  - if contaminated tools are to be placed on non-contaminated equipment for transport to the decontamination pad, plastic should be used to keep the equipment clean; and
  - drill cuttings (i.e., soil) should be contained and kept out of the way of workers.

11.2 Decontamination

All personnel and equipment exiting an EZ will be thoroughly decontaminated. Safety briefings will explain the decontamination procedures for personnel and portable equipment for the various levels of protection indicated in Section 8.2. Heavy equipment will be decontaminated with either a steam cleaner, pressure washer, or potable water. Rinseates will be collected,

handled, and/or drummed as potentially hazardous waste. Additional information on disposal procedures is presented in Section 12.0.

Equipment Decontamination

Non-disposable sampling equipment will be decontaminated through the following steps, if necessary:

- fresh water rinse;
- non-phosphorus detergent wash; and
- fresh water rinse.

12.0 DISPOSAL PROCEDURES

Discarded materials, waste materials, or other objects will be handled in such a way as to preclude the potential for spreading contamination, creating a sanitary hazard, or causing litter to be left onsite. Potentially contaminated materials as determined by the SHSO, e.g., soil, clothing, gloves, etc., will be bagged or drummed, as necessary, and segregated for disposal. Contaminated materials will be disposed in accordance with appropriate regulations. Non-contaminated materials will be collected and bagged for appropriate disposal as normal domestic waste. Waste disposal operations conducted by Roux Associates will be monitored by the SHSO and carried out under the appropriate level of personal protection described in Section 8.2.

13.0 EMERGENCY PLAN

As a result of the hazards onsite and the conditions under which operations are conducted, the possibility of an emergency exists. An emergency plan is required by OSHA 29 CFR 1910.120 to be available for use and is included below. A copy of this plan will be posted in the SZ at each work site. Figure 1 includes directions and a map to Albany Medical Center.

13.1 Site Emergency Coordinator(s)

The Site Emergency Coordinator(s) are the Field Team Leader and the SHSO. The Site Emergency Coordinator(s) will contact the local fire, police, and other emergency units prior to beginning work onsite. In these contacts, the Site Emergency Coordinator(s) will inform the emergency units about the nature and duration of work expected on the Site and the type of contaminants and possible health or safety effects of emergencies involving these contaminants. Also at this time, the coordinators and the emergency response units will make arrangements to handle any emergencies that might occur.

The Site Emergency Coordinator(s) will implement the emergency plan whenever conditions at the Site warrant such action. The coordinator(s) will be responsible for assuring the evacuation, emergency treatment, emergency transport of Site personnel, as necessary, and notification of emergency response units and the appropriate management staff.

Emergency Site Control

In the event of an emergency, the Site Emergency Coordinator(s) will discourage any unauthorized personnel from entering the Site. If necessary, the Site Emergency Coordinator(s) will contact the proper authorities.

13.2 Evacuation

In the event of an emergency situation such as fire, explosion, significant release of particulates, etc., an air horn, automobile horn, or other appropriate device will be sounded by the SHSO or field crew personnel for approximately 10 seconds, indicating the initiation of evacuation procedures. All persons in both the restricted and non-restricted areas will evacuate and assemble near the SZ or other safe area as identified by the Site Emergency Coordinator(s). The Site Emergency Coordinator(s) will have authority to initiate proper action if outside services are

required. Under no circumstances will incoming personnel or visitors be allowed to proceed into the area once the emergency signal has been sounded. The SHSO must see that access for emergency equipment is provided and that all combustion apparatus has been shut down once the alarm has been sounded. Once the safety of all personnel is established, the fire department and other emergency response groups will be notified by telephone of the emergency. Then, other personnel listed in Section 13.4 will be notified.

13.3 Potential or Actual Fire or Explosion

If the potential for a fire exists or if an actual fire or explosion occurs, the following procedures will be implemented:

- immediately evacuate the Site as described above (Section 13.2); and
- notify fire, security, and police departments.

13.4 Environmental Incident (Release or Spread of Contamination)

If possible, the spread of contamination will be controlled or stopped. The Site Emergency Coordinator(s) will instruct a person onsite to immediately contact police and fire authorities to inform them of the possible or immediate need for nearby evacuation. If a significant release has occurred, the National Response Center and other appropriate groups will be contacted. Those groups will alert National or Regional Response Teams as necessary. Following these emergency calls, the remaining personnel listed in the table below will be notified, as necessary.

Responsibility	Contact	Telephone
Fire Department	Rensselaer Police (dispatches)	911
Police Department	Rensselaer Police	911
Ambulance	Rensselaer Police (dispatches)	911
Hospital (see Figure 1)	Albany Medical Center	(518) 262-3125
National Response Center (Release or Spill)		800-424-8802
Chemical Transport Emergency Center (CHEMTREC)		800-424-9300
Site Health and Safety Officer	Dana Bulcock	(631) 232-2600
Project Manager	Dana Bulcock	(631) 232-2600
Project Principal	Charlie McGuckin, P.E.	(631) 232-2600

Responsibility	Contact	Telephone
Site Contact	Wayne St. Clair	(518) 465-6534
Office Health and Safety Manager	Joseph Gentile, CIH	(856) 423-8800/ (610) 844-6911

13.5 Personal Injury

If onsite personnel require emergency medical treatment, the following steps will be taken:

1. Notify the Fire Department or Ambulance service and request an ambulance or transport the victim to the hospital, as appropriate.
2. Decontaminate, to the extent possible, prior to administration of first aid or movement to emergency facilities.
3. First aid will be provided by emergency medical services (EMS) or by onsite personnel trained in first aid, CPR, and bloodborne pathogens, if available.
4. The OHSM will supply medical data sheets on the victim (if a Roux Associates employee) to appropriate medical personnel.

13.6 Overt Personnel Exposure

If an overt exposure to toxic materials occurs, the exposed person will be treated onsite as follows:

Skin Contact:	Remove contaminated clothing. Wash immediately with water. Use soap if available. Contact EMS, if necessary.
Inhalation:	Remove from contaminated atmosphere. Contact EMS, if necessary. Transport to hospital.
Ingestion:	Never induce vomiting on an unconscious person. Also, never induce vomiting when acids, alkalis, or petroleum products are suspected. Contact the poison control center. Contact EMS, if necessary.
Puncture Wound or Laceration:	Decontaminate and transport to emergency medical facility or contact EMS. Do not contact blood or bodily fluids. The OHSM will provide medical data sheets to medical personnel as requested.

13.7 Adverse Weather Conditions

In the event of adverse weather conditions, the SHSO will determine if work can continue without risking the health and safety of onsite workers. Some of the items to be considered prior to determining if work should continue are the following:

- heavy rainfall;
- potential for heat stress (see Appendix C);
- potential for cold stress and cold-related injuries (see Appendix C);
- limited visibility;
- potential for electrical storms;
- potential for malfunction of H&S monitoring equipment or gear;
- potential for accidents;
- unsafe driving and working conditions due to snow or ice; and
- high wind.

14.0 FIELD TEAM REVIEW

Each Roux Associates field member shall sign this section after Site-specific training is completed and before being permitted to work onsite.

I have read and understand this Site-Specific Health and Safety Plan. I will comply with the provision contained herein. I have been provided with an opportunity to have questions and concerns addressed by the Project Manager.

Site/Project: BASF Rensselaer Facility/Landfill Remediation and Closure
Rensselaer, New York

Name Printed	Signature	Date

15.0 APPROVALS

The Approval Page must be attached and signed by the SHSO, OHSM, PM, and PP.

By their signature, the undersigned certify that this HASP is approved and will be utilized by Roux Associates, Inc. personnel at the BASF Rensselaer Facility located in Rensselaer, New York.

Site Health and Safety Officer	Date
Office Health and Safety Manager	Date
Project Manager	Date
Project Principal	Date

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at the Site

Compound	CAS #	TLV	IDLH	PEL	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Arsenic (As)	7440-38-2	0.01 mg/m^3	(ND)	10 $\mu g/^{m3}$	Dermal; inhalation; ingestion	Sensory irritant Lung & Skin Cancer Aplastic anemia Numbness	skin eyes lungs blood peripheral nervous system	Silver gray - tin white BP: sublimes
Benzene	71-43-2	1.6 mg/m^3 0.5 ppm	Ca (ND)	1 ppm	Dermal; inhalation ingestion	CNS depression Hematopoietic depression Dermatitis	CNS blood skin eyes resp system bone marrow	Liquid (solid below 42°F BP: 80.093°C flammable LEL: 1.4% UEL: 8.0%
Cadmium (Dust)	7440-43-9	0.01 mg/m^3	9 mg/m^3	0.005 mg/m^3	Inhalation; ingestion	Sensory irritant Lung injury Kidney disease Cancer	skin eyes kidneys bone	Silver-white/blue tinged BP: 1409°F Noncombustible
Chromium (VI)	7440-47-3	0.05 mg/m^3	(ND)	None	Dermal; inhalation; ingestion	Nasal and lung tumors Sensory irritant	lungs eyes skin	Red, rhombic crystals
Copper (dusts and mists as Cu)	7440-50-8	1 mg/m^3	100 mg/m^3	1 mg/m^3	Dermal; inhalation; ingestion	Sensory irritant GI irritation CNS depressant	skin eyes GI tract CNS	Reddish metal BP: 4730°F Powdered form may ignite
1,2-Dichloroethane (Ethylene dichloride)	107-06-2	40 mg/m^3 10 ppm	Ca (ND)	4.0 mg/m^3 1 ppm	Dermal; ingestion; inhalation	CNS depressant Liver neurosis Kidney damage Dermatitis	CNS liver kidneys skin	Colorless liquid BP: 83.5° LEL: 6.2% UEL: 15.9%

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at the Site

Compound	CAS #	TLV	IDLH	PEL	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Ethylbenzene	100-41-4	434 mg/m^3 100 ppm	800 ppm (10% LEL)	435 mg/m^3 100 ppm	Dermal; inhalation; ingestion	Sensory irritant CNS depressant Narcosis Hematological disorders	eyes skin CNS respiratory system blood	Liquid aromatic odor BP: 277°F Fl.P: 59°F LEL: 1.2% UEL: 7.0%
Lead (as Pb)	7439-92-1	0.05 mg/m^3	100 mg/m^3	<0.1 mg/m^3	Dermal; inhalation ingestion	Abdominal pain CNS depressant Anemia Nephropathy Reproductive effects	GI tract CNS blood kidneys	Metal - soft gray BP: 3164°F
Mercury vapor	7439-97-6	0.05 (skin)	28 mg/m^3	0.05 (skin)	Dermal; inhalation; ingestion	Tremor Insomnia Chest pain GI disturbance Eye irritant Skin irritant	skin resp system CNS kidneys eyes	Silver, white, odorless liquid BP = 674°F
Nickel	7440-02-0	1.5 mg/m^3	Ca 10 mg/m^3	0.015 mg/m^3	Dermal; inhalation; ingestion	Pulmonary fibrosis Lung cancer Sinus cancer Sensory irritant GI irritation	lungs skin eyes GI tract	Silver-white metal BP: 2730°
Toluene	108-88-3	188 mg/m^3 50 ppm	500 ppm	200 ppm	Dermal; inhalation; ingestion	CNS depression Liver damage Kidney damage Defatting of skin	CNS liver kidney skin	Liquid benzene odor BP: 110.4°C flammable LEL: 1.2% UEL: 7.1%

Table 1. Toxicological, Physical, and Chemical Properties of Compounds Potentially Present at the Site

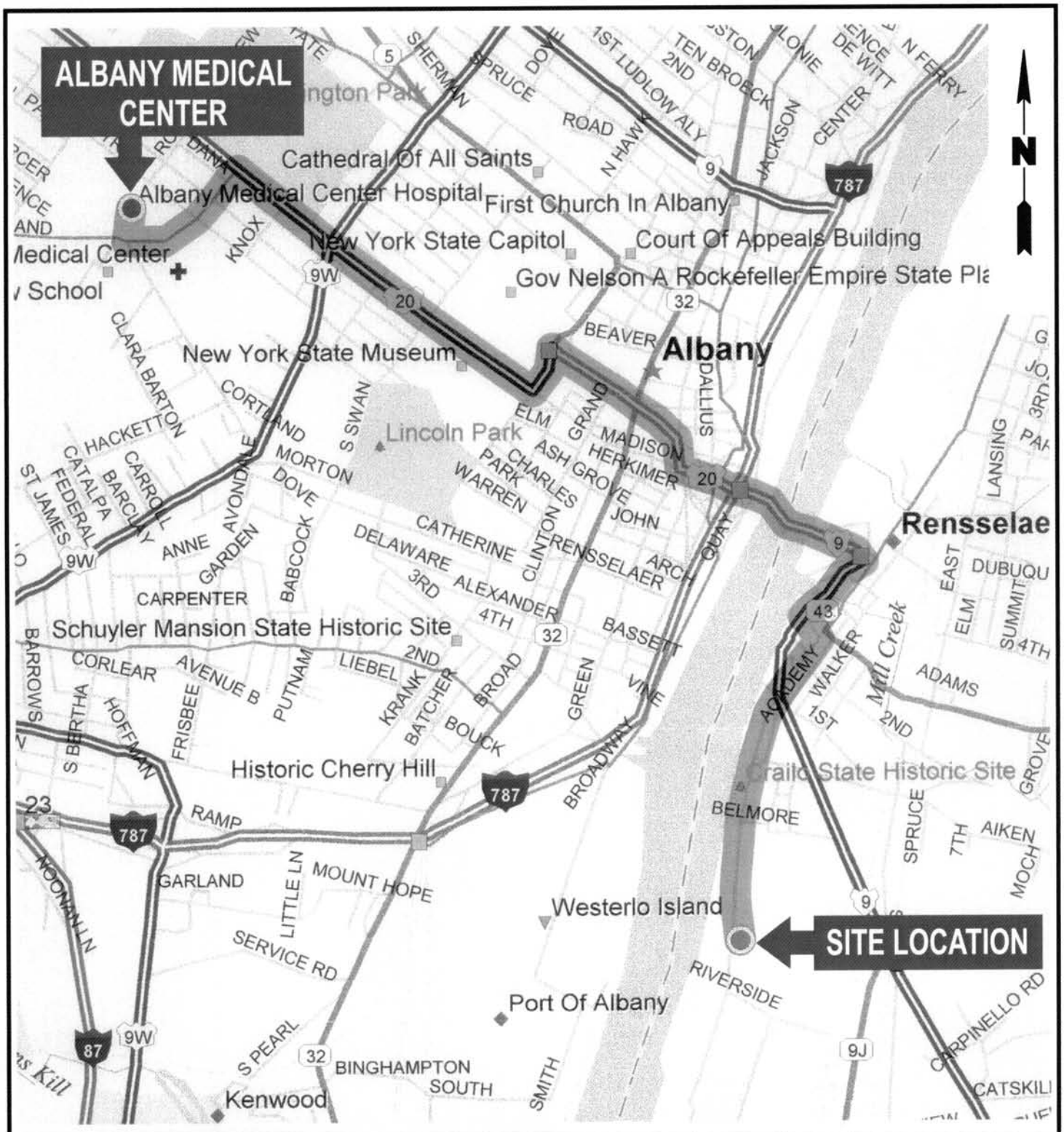
Compound	CAS #	TLV	IDLH	PEL	Routes of Exposure	Toxic Properties	Target Organs	Physical/Chemical Properties
Xylene(s)	1330-20-7	434 mg/m^3 100 ppm	900 ppm	435 mg/m^3 100 ppm	Dermal; inhalation; ingestion	Sensory irritant Blood dyscrasia Bronchitis CNS depression	CNS eyes skin GI tract blood liver kidneys	Liquid Aromatic odor BP: 138.5° flammable LEL: 1.1% UEL: 7.0%
Zinc Oxide (dust)	7440-66-6	10 mg/m^3	None	10 5 resp.	Dermal; inhalation; ingestion	Skin irritant Cough	skin lungs	Bluish-white metallic element BP: 908°

Notes:

Ca – Carcinogen
TLV – Threshold Limit Value (ACGIH)
IDLH – Immediately Dangerous to Life and Health (OSHA)
PEL – Permissive Exposure Level (OSHA)
PPM – Parts per million
mg/m^3 – milligrams per cubic meter
Fl. Pt. – Flash point
LEL – Lower Explosive Level
UEL – Upper Explosive Level
BP – Boiling Point
NA – Not Available
ND – Not Determined

References:

Guide to Occupational Exposure Values, 2000. American Conference of Governmental Industrial Hygienists.
Hawley's Condensed Chemical Dictionary, Sax, N. Van Nostrand and Reinhold Company, 11th Edition, 1987.
Occupational Safety and Health Administration, 1993. General Industry Air Contaminant Standard (2a CFR 1910.1000).
Proctor, N.H., J.P. Hughes and M.L. Fischman, 1989. Chemical Hazards of the Workplace. Van Nostrand Reinhold. New York.
Sax, N.I. and R.J. Lewis, 1989. Dangerous Properties of Industrial Materials. 7th Edition. Van Nostrand Reinhold. New York.
U.S. Department of Health and Human Services, 1997. NIOSH Pocket Guide to Chemical Hazards.



DIRECTIONS TO HOSPITAL

1. EXIT FACILITY AND HEAD NORTH ON RIVERSIDE AVENUE.
2. TURN LEFT ONTO ROUTE 20 AND CROSS DUNN MEMORIAL BRIDGE. STAY ON ROUTE 20.
3. TURN LEFT ONTO NEW SCOTLAND AVENUE. FOLLOW SIGNS TO EMERGENCY ROOM.

Title:

HOSPITAL ROUTE MAP

ALBANY MEDICAL CENTER
43 SCOTLAND AVENUE
ALBANY, NEW YORK

Prepared for:

BASF CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: M.R.	Date: 17DEC01	FIGURE
Prepared by: B.H.C.	Scale: UNKNOWN	1
Project Mgr.: M.R.	Office: NY	
File No.: BF1119701.CDR	Project No.: 25111y03	

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APPENDIX A

OSHA Poster

You Have a Right to a Safe and Healthful Workplace.

IT'S THE LAW!

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.

The *Occupational Safety and Health Act of 1970 (OSH Act)*, P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act*. The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at **www.osha.gov**. If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

1-800-321-OSHA

www.osha.gov

U.S. Department of Labor • **Occupational Safety and Health Administration** • **OSHA 3165**

APPENDIX B

Field Change Request

HEALTH AND SAFETY FIELD CHANGE REQUEST FORM

SITE SAFETY REVIEW – CHANGES AND OVERALL EVALUATION
(To Be Completed For Each Field Change In Plan)

Was the Safety Plan followed as presented? _____ Yes _____ No

Describe, in detail, all changes to the Safety Plan:

_____

_____

_____

Reasons for changes:

_____

_____

_____

Follow-Up, Review and Evaluation Prepared by _____ Date _____

Discipline _____

Approved by: Site Manager _____ Date _____

Site Safety Officer _____ Date _____

Approved by: Office Health & Safety Supervisor _____ Date _____

Evaluation of Site Safety Plan:

Was the Safety Plan adequate? _____ Yes _____ No

What changes would you recommend?

_____

_____

_____

_____

APPENDIX C

Temperature Hazards

Heat Stress

Heat stress is a significant potential hazard and can be associated with heavy physical activity and/or the use of personal protective equipment (PPE) in hot weather environments.

Heat cramps are brought on by prolonged exposure to heat. As an individual sweats, water and salts are lost by the body resulting in painful muscle cramps. The signs and symptoms of heat cramps are as follows:

- severe muscle cramps, usually in the legs and abdomen;
- exhaustion, often to the point of collapse; and
- dizziness or periods of faintness.

First aid treatment includes moving to a shaded area, rest, and fluid intake. Normally, the individual should recover within one-half hour. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to a hospital for medical attention.

Heat exhaustion may occur in a healthy individual who has been exposed to excessive heat. The circulatory system of the individual fails as blood collects near the skin in an effort to rid the body of excess heat. The signs and symptoms of heat exhaustion are as follows:

- rapid and shallow breathing;
- weak pulse;
- cold and clammy skin with heavy perspiration;
- skin appears pale;
- fatigue and weakness;
- dizziness; and
- elevated body temperature.

First aid treatment includes cooling the victim, elevating the feet, and replacing fluids and electrolytes. If the individual has not recovered within 30 minutes and the temperature has not decreased, the individual should be transported to the hospital for medical attention.

Heat stroke occurs when an individual is exposed to excessive heat and stops sweating. This condition is classified as a **MEDICAL EMERGENCY**, requiring immediate cooling of the victim and transport to a medical facility. The signs and symptoms of heat stroke are as follows:

- dry, hot, red skin;
- body temperature approaching or above 105°F;
- large (dilated) pupils; and
- loss of consciousness - the individual may go into a coma.

First aid treatment requires immediate cooling and transportation to a medical facility.

Heat stress (heat cramps, heat exhaustion, and heat stroke) is a significant hazard if any type of protective equipment (semi-permeable or impermeable) which prevents evaporative cooling is worn in hot weather environments. Local weather conditions may require restricted work schedules in order to adequately protect personnel. The use of work/rest cycles (including working in the cooler periods of the day or evening) and training on the signs and symptoms of heat stress should help prevent heat-related illnesses from occurring. Work/rest cycles will depend on the work load required to perform each task, type of protective equipment, temperature, and humidity. In general, when the temperature exceeds 88°F, a 15 minute rest cycle will be initiated once every two hours. In addition, potable water and fluids containing electrolytes (e.g., Gatorade) will be available to replace lost body fluids.

Cold Stress

Cold stress is a danger at low temperatures and when the wind-chill factor is low. Prevention of cold-related illnesses is a function of whole-body protection. Adequate insulating clothing must be used when the air temperature is below 40°F. In addition, reduced work periods followed by rest in a warm area may be necessary in extreme conditions. Training on the signs and symptoms of cold stress should prevent cold-related illnesses from occurring. The signs and symptoms of cold stress include the following:

- severe shivering;
- abnormal behavior;

- slowing of body movement;
- weakness;
- stumbling or repeated falling;
- inability to walk;
- collapse; and/or
- unconsciousness.

First aid requires removing the victim from the cold environment and seeking medical attention immediately. Also, prevent further body heat loss by covering the victim lightly with blankets. Do not cover the victim's face. If the victim is still conscious, administer hot drinks, and encourage activity, such as walking wrapped in a blanket.

APPENDIX D

Incident Reports

INCIDENT REPORT

Site _____

Site Location _____

Report Prepared By _____
Name Printed Title

Incident Category (Check all that apply)

_____ Injury	_____ Illness	_____ Property Damage
_____ Near Miss	_____ On-Site Equipment	_____ Chemical Exposure
_____ Motor Vehicle	_____ Fire	_____ Electrical
_____ Mechanical	_____ Other	

Date and Time of Incident _____

Name of Persons Injured (see end of report for details)

_____

_____

_____

Narrative Report of Incident

(Provide sufficient detail so that the reader may fully understand the actions leading to or contributing to the incident, the incident occurrence, and actions following the incident. Append additional sheets of paper, if necessary.)

_____

_____

_____

_____

_____

Witnesses to Incident

1. Name _____
   Company _____
   Address _____
   Telephone No. _____

2. Name _____
   Company _____
   Address _____
   Telephone No. _____

Property Damage

Brief Description of Property Damage _____

_____

_____

_____

Estimate of Damage _____

Incident Location

_____

_____

Incident Analysis

(Causative agent most directly related to accident (object, substance, material, machinery, equipment, conditions.)

_____

_____

Was weather a factor? _____

Unsafe mechanical/physical/environmental condition at time of incident (be specific, must be answered):

_____

Unsafe act by injured and/or others contributing to the incident (be specific, must be answered):

_____

Personal factors (improper attitude, lack of knowledge or skill, slow reaction, fatigue):

_____

On-Site Incidents

Level of personal protection equipment required in Site Safety Plan:

_____

_____

_____

Modifications:

_____

_____

Was injured using required equipment?

_____

Project #: _____
Project Name: _____
Location: _____
Date: _____

Incident Follow-Up

_____

Date of Incident:

_____

Brief Description of Incident:

_____

_____

Outcome of Incident:

_____

_____

Physician's Recommendations:

_____

_____

Date Injured Returned to Work:

_____

APPENDIX B

Community Air Monitoring Plan

May 30, 2006

COMMUNITY AIR MONITORING PLAN ALTERNATIVE LANDFILL CLOSURE

Rensselaer Facility
Rensselaer, New York

Prepared for

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BF25111Y27.456/CV-CAMP

TABLE OF CONTENTS

APPENDIX

1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) has been prepared by Roux Associates, Inc. (Roux Associates) to ensure that excavation and soil handling activities at the Closed Landfill (Landfill) portion (Site Code 442004) of the inactive BASF Rensselaer Facility (Site) in Rensselaer County, New York do not adversely affect the downwind community, and to preclude or minimize airborne migration of Site contaminants to offsite areas. The CAMP is consistent with both the New York State Department of Environmental Conservation (NYSDEC) Technical and Administrative Guidance Memorandum #4031 (Fugitive Dust Suppression and Particulate Monitoring Program at Inactive Hazardous Waste Sites) and the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan. Compliance with this CAMP is required during all activities associated with the excavation and handling of soil, waste and debris (collectively referred to as waste materials), both impacted and clean, including excavation, stockpiling, mechanical screening, loading, and disposal (collectively known as excavation activities).

Previous sampling activities at the Landfill have indicated elevated levels of volatile organic compounds (VOCs) in the northern (referred to as Areas 1A and 1B on Figure 4 of the Interim Remedial Measure [IRM] Plan) and central and south-central portions of the Landfill (referred to as Areas 2A through 2E on Figure 5 of the IRM Plan). Based on the nature of intrusive activities and known contaminants, real-time air monitoring for VOCs and particulates will be conducted at fixed locations and via walk-around perimeter and work zone monitoring.

2.0 SCOPE OF WORK

The Scope of Work will consist of the excavation and offsite disposal of waste materials containing elevated levels of VOCs from Areas 1A and 1B from the northern portion of the Landfill as shown on Figure 4 of the IRM Plan, and Areas 2A through 2E from the central and south-central portions of the Landfill as shown on Figure 5 of the IRM Plan. The excavation depth will be either approximately eight feet below land surface or to the underlying silt/clay layer. A total of approximately 3,500 cubic yards of waste material will be removed as part of the Landfill IRM. If grossly contaminated soil is encountered along the perimeter of any excavation, the excavation will be expanded to remove the grossly contaminated soil.

Mechanical equipment will be used to excavate all waste materials encountered during the performance of the Landfill IRM. To the extent practicable, bulk waste and debris will be separated from more soil-like material and staged separately. Excavated soil containing significant amounts of debris and bulk waste that cannot be easily segregated will be mechanically processed at the discretion of BASF using a vibratory screener. This will facilitate the separation of debris and bulk waste from soil-like material, and potentially comply with the requirements of the receiving disposal facility.

3.0 AIR MONITORING PROCEDURES FOR SOIL EXCAVATION AND HANDLING

VOCs are the constituents of concern at the excavation areas of the Landfill. The appropriate method to monitor air for these constituents during excavation is through real-time VOC and air particulate (dust) monitoring.

3.1 Meteorological Data

Meteorological data consisting of wind speed, wind direction, temperatures and barometric pressure will be collected. At a minimum, a full set of values will be collected at the start of each workday, noon of each workday, and the end of each workday. These readings will be utilized to position the VOC and particulate monitoring equipment in appropriate upwind and downwind locations. A Davis Corporation wireless instrument station or similar equipment will be used to collect all meteorological monitoring data.

3.2 VOC Monitoring

During all intrusive activities, VOCs will be monitored periodically at the upwind perimeter and continuously at the downwind perimeter of the designated work areas at monitoring stations described below. Monitoring equipment capable of measuring total VOC concentrations (photo-ionization detector [PID]) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights of approximately 4 to 5 feet above land surface (i.e., the breathing zone). The audible alarm on the PID will be set at 5 parts per million (ppm). Monitoring equipment will be MiniRAE 2000 portable VOC monitors or similar equipment.

Upwind VOC concentrations will be measured at the upwind edge of the work area, which will be determined based upon the meteorological data collected throughout the workday. All VOC monitoring will be performed using a PID calibrated at least once per day prior to work activities and recalibrated as needed thereafter. Downwind VOC concentrations will be measured at the downwind edge of the work area, which will be determined based upon the meteorological data collected throughout the workday. Both upwind and downwind monitoring stations are subject to change in response to evolving weather conditions.

The following summarizes VOC action levels and the appropriate responses:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps are performed, work activities can resume, provided the total organic vapor level 200 feet downwind of the work area or half the distance to the nearest potential receptor or residential/commercial structure–whichever is less but in no case less than 20 feet–is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown, the source of vapors identified, and corrective measures taken to abate emissions, as described below in Section 3.2.1. Downwind air monitoring (as directed by the Site Health and Safety Officer [SHSO]) will be implemented to ensure that vapor emission does not impact the nearest residential or commerical structure at levels exceeding those specified in Section 3.2.2.

All readings will be recorded and will be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report as shown in Appendix A-1 will be completed.

3.2.1 Potential Corrective Measures and VOC Suppression Techniques

If the 15-minute integrated VOC level at the downwind location persists at a concentration that exceeds the upwind level by more than 5 ppm but less than 25 ppm during excavation activities, then vapor suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive organic vapors:

- Limiting the excavation size;
- Spraying water onto the excavation faces and equipment;
- Covering soil stockpiles with 6-mil plastic sheeting;
- Hauling waste materials in properly tarped containers; and/or
- Applying vapor suppressant foam.

Work may continue with organic vapor suppression techniques provided that downwind organic vapor levels are not more than 25 ppm greater than the upwind levels.

If organic vapor suppression techniques do not lower levels to below 25 ppm, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

3.2.2 Major Vapor Emission

If detected organic vapor levels are greater than 5 ppm above background levels downwind of the Site boundary, or half the distance to the nearest residential or commercial property, whichever is less, all work activities will cease.

If, following cessation of work activities, or as the result of an emergency, organic vapor levels persist above 5 ppm above background levels downwind of the Site boundary or half the distance to the nearest residential or commercial property from the work zone, then air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 foot zone).

If either of the following criteria is exceeded in the 20 foot zone, the Major Vapor Emission Response Plan (Section 3.2.3) shall be implemented. The criteria are:

- Organic vapor levels that approach 5 ppm above background levels for a period of more than 30 minutes; or
- Organic vapor levels greater than 10 ppm above background levels for any time period.

3.2.3 Major Vapor Emission Response Plan

If the Site conditions warrant, the following actions will be undertaken:

- All emergency response contacts as listed in the Health and Safety Plan of the IRM Plan will be notified as appropriate;
- The local police authorities will be immediately contacted by the SHSO and advised of the situation; and
- Frequent air monitoring will be conducted at 30 minutes intervals within the 20 foot zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the SHSO.

3.3 Particulate Monitoring

Air monitoring for particulates (i.e., dust) will be performed continuously during excavation activities, using both air monitoring equipment and visual observation. Monitoring equipment capable of measuring particulate matter smaller than 10 microns (PM_{10}) and capable of integrating (averaging) over periods of 15 minutes or less will be set up at upwind (i.e., background) and downwind locations, at heights approximately four to five feet above land surface (i.e., the breathing zone). Monitoring equipment will be MIE Data Ram monitors or equivalent. The audible alarm on the particulate monitoring device will be set at 90 micrograms per cubic meter ($\mu g/m^3$). This setting will allow proactive evaluation of worksite conditions prior to reaching the action level of 100 $\mu g/m^3$ above background. The monitors will be calibrated at least once per day prior to work activities and recalibrated as needed thereafter.

The following summarizes particulate action levels and the appropriate responses:

- If the downwind PM_{10} particulate level is 100 $\mu g/m^3$ greater than background (upwind perimeter) for the 15 minute period, or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM_{10} particulate levels do not exceed 150 $\mu g/m^3$ above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM_{10} particulate levels are greater than 150 $\mu g/m^3$ above the upwind level, work must be stopped and an evaluation of activities initiated. Work can resume provided that dust suppression measures (as described in Section 3.3.1 below) and other controls are successful in reducing the downwind PM_{10} particulate concentration to within 150 $\mu g/m^3$ of the upwind level, and in preventing visible dust migration.

All readings will be recorded and will be available for NYSDEC and NYSDOH personnel to review. If an exceedance of the Action Limits occurs, an Action Limit Report as shown in Appendix A-1 will be completed.

3.3.1 Potential Particulate Suppression Techniques

If the integrated particulate level at the downwind location exceeds the upwind level by more than 100 $\mu g/m^3$ at any time during excavation activities, then dust suppression techniques will be employed. The following techniques, or others, may be employed to mitigate the generation and migration of fugitive dusts:

- Limiting the excavation size;
- Spraying water onto the excavation faces, equipment, and haul roads;
- Covering soil stockpiles with 6-mil plastic sheeting;
- Hauling waste materials in properly tarped containers; and/or
- Limiting vehicle speeds onsite.

Work may continue with dust suppression techniques provided that downwind PM_{10} levels are not more than 150 $\mu g/m^3$ greater than the upwind levels.

There may also be situations where the dust is generated by excavation activities and migrates to downwind locations, but is not detected by the monitoring equipment at or above the action level. Therefore, if dust is observed leaving the working area, dust suppression techniques such as those listed above will be employed.

If dust suppression techniques do not lower particulates to below 150 $\mu g/m^3$, or visible dust persists, work will be suspended until appropriate corrective measures are identified and implemented to remedy the situation.

APPENDIX A-1

Action Limit Report

ACTION LIMIT REPORT

Project Location: _____

Date: _____ Time: _____

Name: _____

Contaminant: PM-10: _____ VOC: _____

Wind Speed: _____ Wind Direction: _____

Temperature: _____ Barometric Pressure: _____

DOWNWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

UPWIND DATA

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

BACKGROUND CORRECTED LEVELS

Monitor ID #: _____ Location: _____ Level Reported: _____

Monitor ID#: _____ Location: _____ Level Reported: _____

ACTIONS TAKEN