NC Solid Waste Section Guidelines For Corrective Action At Solid Waste Management Facilities

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION

The Solid Waste Section believes developing ACM and CAP submission guidelines for all solid waste management facilities will:

- assist the regulated community with preparing a technically complete plan,
- provide the minimum requirements of technical content of a written plan, and
- reduce the need for subsequent modification.

There may be some site-specific instances where technical data may require additional information beyond that listed in these instructions as a means of more fully characterizing the technical data available and conclusions derived from that data. These instructions set no limit on the number or content of such additional report sections as long as the information included pertains to that required of an ACM or a CAP.

Summary of Required Actions Prior to Submitting an Assessment of Corrective Measures (ACM) Report

1. Complete delineation of contaminant plume; and
2. Identify all contaminants of concern.

NC Solid Waste Section Assessment of Corrective Measures (ACM) Report

Signature Page = This page should contain the signature and seal of the NC certified geologist.

Chapter 1 = Introduction

- Site Background
- Aquifer Characteristics
- Contaminant Distribution
- Site Conceptual Model – 3D representation of site conditions that represent what is known (or suspected) about the physical, chemical, and biological processes that determine the transport of contaminants from sources through environmental media to potential receptors.

Chapter 2 = Contaminant Characterization

- Contaminants of Concern
- Contaminant Source Confirmation
- Source Control Measures
- Groundwater End Use
- Sensitive Receptor Pathways – risks
- Exposure Pathways – risks
- Background Concentrations
- Exceedances of Groundwater Quality Standards and Exceedances of Surface Water Quality Standards
- Media of Concern

Chapter 3 = Corrective Measures Screening and Evaluation

- Overview
- Institutional Controls – site monitoring, access control, deed restrictions, alternative water supply
- Infiltration Controls – soil covers, clay covers, synthetic covers
- Landfill Gas Controls
- Groundwater Technologies – examples: physical, chemical, biological, extraction

Chapter 4 = Summary and Conclusions

- Conclusions
- Public Meeting
- Financial Assurance

References

Tables (At the Minimum)
Table 1 = Well Construction Details
Table 2 = Historical Groundwater Elevation Data
Table 3 = Summary of Soil Properties
Table 4 = Summary of Estimated Effective Porosities
Table 5 = Summary of Pump Test or Slug Test Results
Table 6 = Summary of Detected Contaminants in Groundwater
Table 7 = Field Parameter Data
Table 8 = Historical Groundwater Results Metals
Table 9 = Historical Groundwater Results VOCs/SVOCs
Table 10 = Historical Surface Water Results Metals
Table 11 = Historical Surface Water Results VOCs/SVOCs
Table 12 = Summary of Contaminant Properties
Table 13 = Contaminant Fate and Transport Characteristics
Table 14 = Summary of Groundwater Geochemical Characteristics
Table 15 = Summary of Corrective Measures Screening Results
Table 16 = Risk Assessment - Lifetime Daily Dose and Risk Calculations (Adult) [LADD = C x IR x ED / (BW x AT)] – EPA, 1986
Table 17 = Risk Assessment - Lifetime Daily Dose and Risk Calculations (Child) [LADD = C x IR x ED / (BW x AT)] – EPA, 1986
Table 18 = Summary of Potable Well Inventory Search Results (if applicable)

Figures (At the Minimum)
Figure 1 = General Site Location Map - Topographic
Figure 2 = Site Map
Figure 3 = Geologic Map
Figure 4 = Site Map With Sampling Locations
Figure 5 = Groundwater Elevation Map Shallow
Figure 6 = Groundwater Elevation Map Deep
Figure 7 = Cross Section A – A'
Figure 8 = Cross Section B – B'
Figure 9 = Cross Section C – C'
Figure 10 = Isoconcentration Map Total VOCs Shallow
Figure 11 = Isoconcentration Map Total VOCs Deep
Figure 12 = Historical VOC Concentration Trends Shallow

Figure 13 = Historical VOC Concentration Trends Deep
Figure 14 = Surface Water Quality
Figure 15 = Stream Dilution Calculation (Worst Case Scenario)
Appendices (At the Minimum)
Appendix A = Boring Logs and Monitoring Well Construction Diagrams
Appendix B = Slug Test or Pump Test Calculation Sheets
Appendix C = Physical and Chemical Characteristics of Contaminants of Concern
Appendix D = Modeling Results
Appendix E = Most Recent Laboratory Analytical Results
Appendix F = Most Recent Approved Water Quality Monitoring Plan
Appendix G = Geophysical Logs (if applicable)

Summary of Required Actions After ACM Completion and Approval
The remedy selected must meet the requirements listed in the North Carolina Solid Waste Management Rules and Laws and the Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina 15A NCAC Subchapter 2L.

Solid Waste Management Rules governing a landfill may require a public meeting to discuss the results of the Assessment of Corrective Measures. The Owner/Operator then shall select a remedy and submit a completed Groundwater Corrective Action Application to the Solid Waste Section. The Solid Waste Section may approve the remedy as described, deny the remedy, or ask for additional information.

Once the selected remedy has been approved, please submit a Corrective Action Plan (CAP) to the Solid Waste Section. The Solid Waste Section may approve the CAP as described, disapprove the CAP, or ask for additional information. Implementation of the approved corrective measure(s) and the CAP shall then take place in accordance with the North Carolina Solid Waste Management Rules and Laws and the Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina 15A NCAC Subchapter 2L.

NC Solid Waste Section Corrective Action Plan (CAP)
Submit a site-specific groundwater remediation plan able to be protective of human health and the environment, able to attain the groundwater protection standards, control the source of the release, and comply with applicable State and Federal standards for the management of solid waste.

Signature Page = This page should contain the signature and seal of the NC certified geologist and/or NC certified engineer.

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- Aquifer Characteristics
- Contaminant Distribution
- Site Conceptual Model – 3D representation of site conditions that represent what is known (or suspected) about the physical, chemical, and biological processes that determine the transport of contaminants from sources through environmental media to potential receptors.
- Regulatory Status

Chapter 2 = Contaminant Characterization
- Contaminants of Concern
- Contaminant Source Confirmation
- Source Control Measures

- Groundwater End Use
- Sensitive Receptor Pathways – risks
- Exposure Pathways – risks
- Background Concentrations
- Exceedances of Groundwater Quality Standards and Exceedances of Surface Water Quality Standards
- Media of Concern

Chapter 3 = Selected and Approved Remedy/Technical Approach

- Design and Specifications of Remedy

Chapter 4 = Groundwater and Surface Water Monitoring

- Revised Water Quality Monitoring Plan

Chapter 5 = Evaluation of Effectiveness and Report Submittals

- Physical Changes In Aquifer Conditions
- Chemical Changes In Aquifer Conditions
- Physical Changes In Plume Characteristics
- Chemical Changes In The Plume
- Refining the Site Conceptual Model
- Reports shall include, at a minimum, a summary report including; data tables, laboratory reports, groundwater elevation contour maps in plan view and cross section, isoconcentration contour maps in plan view and cross section, an evaluation of the effectiveness of the corrective action, and graphs illustrating trends of indicator constituents from key/representative monitoring stations

Chapter 6 = Contingency Plan

- If the approved corrective action does not appear to be effectively reducing the groundwater contamination and/or landfill gas concentrations at the site horizontally and vertically, then the contingency plan will need to be implemented; and
- List of triggering events and established responses to those triggering events.

Chapter 7 = Schedule and Maintenance

- Timeline and Schedule (Days from Solid Waste Section Approval)
- O&M
    - Performing operations
    - Long term mechanical maintenance
    - Monitoring of the site equipment associated with the remedial measure
    - Name(s) and contact numbers for those critical site personnel on whom responsibility for overseeing the O&M operations will fall
    - The O&M plan must specify that in the event of the discovery of any deficiency or failure of the operating system, the Owner/Operator will notify the Solid Waste Section within 24 hours of the discovery and provide a written report documenting the cause of the deficiency or breakdown within 15-days of completing repairs
    - Safeguard Measures and Site Security
    - Any requests for modifications of the approved corrective action and the implementation schedule must be submitted in writing to the Solid Waste Section, and may not modify the schedule until approved in writing by the Division of Waste Management.

Chapter 8 = Financial Assurance Requirements

Chapter 9 = Completion of Groundwater Corrective Action

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Table 3 = Summary of Detected Contaminants in Groundwater
Table 4 = Summary of Corrective Measures Screening Results
Table 5 = Timeline/Schedule (Days from Solid Waste Section Approval)

Figures (At the Minimum – Types and Number of Figures Will Be Dependent Upon Remedy Selected)
Figure 1 = General Site Location Map - Topographic
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Appendices (if applicable)