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July 14, 2008

AFIN: 15-00034
Pmt #: 0257-S
REC'D
SCAN ☒ JUL 16 2008
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To: MRZ file

SWMD

Mr. Bryan Leamons
Engineer Supervisor, Solid Waste Management Division
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

RE: Response to NODs (Notice of Deficiencies)
City of Morrilton Class 1 Landfill Permit Modification Application
Solid Waste Permit No. 0257-S, AFIN: 15-00034
FTN No. 4490-100

Dear Mr. Leamons:

On behalf of the City of Morrilton, FTN Associates, Ltd. (FTN) is submitting this response to the NODs listed in your letter of July 3, 2008.

1. **ADEQ Comment: Section 2.2, Flood Plain:**
This section only repeats the regulation. Please provide information specific to the site.

***Response**: The first paragraph of Section 2.2, on the bottom of p. 2-1, repeats the regulation. The next page (p. 2-2) is Figure 2.1, which is referenced in Section 2.1. The second paragraph of Section 2.2 is on p. 2-3 and states, "The landfill site is located outside the boundary of any delineated special flood hazard areas, as indicated on the current (June 3, 1986) Flood Insurance Rate Map (FIRM) for Conway County. The Landfill will be designed and operated such that it will not restrict the flow of the base flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste. The applicable portion of the FIRM is shown as Figure 2.2." Figure 2.2, showing the floodplain, is on p. 2-4.*

2. **ADEQ Comment: Section 2.6, Unstable Areas:**

Last sentence of this section mentions that stability of the subsurface materials is provided in Appendix D, Design Report. However, Appendix D makes no mention of subsurface material stability. Please make the proper correction.

***Response:** No additional subsurface stability analysis was required for the facility since the original geotechnical analysis was adequate. The last sentence of this section of the Permit Application Report has been deleted.*

3. **Section 3.3, Cover Material Requirement:**
This section states that "The Landfill may utilize an alternative synthetic cover material for daily cover in conjunction with the soil cover." At present an alternative daily cover has been approved

for an interim period ending February 28, 2009. Any type of alternative daily cover must be approved by ADEQ prior to its application. Please specify.

Response: *A letter requesting approval to use alternative daily cover past the date covered by the interim period will be submitted to ADEQ.*

4. **Section 4.0, Stormwater Management Procedures:**
This section states "The water is discharged from the site and monitored under general National Pollutant Discharge Elimination System (NPDES) Permit No. ARG160001." Section 4.2 NPDES Monitoring – states that "All stormwater is discharged to the city's wastewater treatment system and therefore there are no discharges that require reporting." The two statements contradict each other. Please make the proper correction.

Response: *The facility has an NPDES Permit ARG160001, which requires a sedimentation pond and to manage stormwater runoff from the landfill through the pond. The facility has two ponds, a Sedimentation Pond and a Stormwater Pond. All stormwater runoff from the landfill is conveyed to the ponds and any water discharged from the ponds is conveyed directly to a city sanitary sewer pipeline that is immediately west of the two ponds. None of the water in the ponds is discharged to a receiving body of water. The text in this section of the Operating Plan has been modified to clarify stormwater management procedures for the facilities.*

5. **Section 6.5, Groundwater Monitoring Parameters:**
Please revise this section based on below comment #11.

Response: *See response to comment #11.*

6. **Appendix E, Operating Plan, Section 6.4, Leachate Sampling:**
Leachate sampling frequency and sampling parameters should be the same as that of groundwater monitoring, (see below comment #11). Please revise accordingly.

Response: *Leachate sampling will be conducted at the same frequency as groundwater monitoring. The leachate parameter list provided is the full Regulation No. 22, Appendix 1 list for detection monitoring. Should the facility be placed in assessment monitoring at any time in the future, the leachate parameter list would be expanded to include Regulation No. 22, Appendix 2 parameters. Section 6.4 has been revised accordingly.*

7. **Appendix E, Operating Plan, Section 9.3.3, Annual Engineering Report:**
The list you provided falls short of minimum requirements listed in Reg. 22.423. Please make proper correction.

Response: *Section 9.3.3 has been revised to include all the items listed in Reg. 22.423.*

8. **Appendix G, Explosive Gas Monitoring, Section 3.3:**
The geological setting at this site may make it difficult to use direct push techniques for installation of gas probes. Please specify alternative techniques. Also, the 2-inch boreholes with ¾ inch pipe may cause voids to occur in the filter pack. We recommend installing larger diameter boreholes.

Response: *As stated in this section, the depths of the probe holes will be installed at varying depths corresponding to the lowest elevation of waste at the site (approximately 291 ft NGVD). Waste cells at the site are not excavated to depths that encounter shale at the site; moreover, cells are constructed such that the minimum separation of 2 ft between bedrock and the top of the landfill liner is maintained. It is anticipated that direct-push techniques (DPT) will be capable of installing the probes. If site conditions do not allow installation of the probes using DPT, a hollow-stem auger drill rig will be used to drill a larger borehole and larger diameter casing will be installed. The text in Section 3.3 has been revised accordingly.*

Advancing boreholes using DPT and installing ¾-inch pipe to construct gas probes has been successful at other sites (e.g., Jonesboro Class 4 landfill) with no apparent problems. Where possible, it is a cost-effective method of installing gas monitoring probes.

The actual outside diameter of the DPT probe tip is 2.25 inches. FTN has revised the design of the gas probes to include a ½-inch casing in lieu of the ¾-inch casing to allow for additional annular space. Any voids that could occur in the sand filter pack should not prevent the measurement of gas that may be migrating through the soil.

9. **Appendix J, Closure and Post Closure Care Plan, Section 3.1:**
Please include the requirements of Reg. 22.1302(b)(4), (5), & (6).

Response: *Section 3.1 has been revised to include the requirements of these sections.*

10. **Section 6.4, Groundwater Monitoring Reporting and 6.6, Sampling Frequency:** During detection monitoring, groundwater sampling at the facility is semi-annual. Per Regulation No. 22, sampling will go to quarterly if the facility goes into assessment monitoring at some point in the future. Please make proper correction in this section and GWSAP as necessary.

Response: *Sections 6.4 and 6.6 have been revised to include the change in reporting and sampling frequency in the event the site is placed in assessment monitoring. A revision of the approved GWSAP is not necessary because procedures to be followed in establishing an assessment monitoring program are discussed in Section 8.0 of the GWSAP.*

11. **Section 6.5, Groundwater Monitoring Parameters:** The SWMD requests the facility return to analyzing for the full list of Appendix 1 parameters plus iron, manganese, and total organic carbon (TOC) per Reg. 22.1204. During the latest sampling event in April 2008, the full list was analyzed except for five metals. Please revise to follow the standard sampling parameters of Reg. 22 in this section and GWSAP as necessary.

Response: *The list of sampled parameters in the approved GWSAP was developed in 2004 in an effort to lower the FWFPR (facility-wide false positive rate), as recommended by EPA (1992[1]). The FWFPR before the reduction in parameters was calculated at about 17% per evaluation period, with EPA recommending 5% or less. At that time, a comparison of leachate data and groundwater monitoring data showed that antimony, cadmium, selenium, silver, and thallium were not reliable indicators of impacts from the Landfill because they were present in leachate at levels similar to background levels in groundwater. Their removal from the routine monitoring*

program is consistent with EPA (1992) recommendations that routine monitoring and statistical testing be limited to parameters that are present in leachate or waste at levels "substantially greater than background." The adjustments to the monitoring program at that time resulted in a FWFPR of 5% or less for each evaluation period, meeting EPA guidelines, yet retaining adequate statistical power to detect real contamination.

The city of Morrilton proposes to sample the additional five metals once every three years to provide documentation that conditions at the site have not significantly changed. If these metals are present in leachate at levels "substantially greater than background", they will be added to the routine monitoring list. This proposed methodology will maintain the FWFPR at a lower level during the remaining sampling events.

A reduced list of detection monitoring parameters is currently being analyzed at at least three other Class 1 landfills in Arkansas and those lists are significantly shorter than the current Morrilton Landfill parameter list. For example, the Waste Management Ozark Ridge and Jefferson County Landfills do not routinely sample any Appendix 1 VOCs (volatile organic compounds) or some of the inorganic constituents; the complete Appendix 1 parameter list (including VOCs) is only sampled every 3 years. This is in addition to these two landfills having a reduced sampling frequency (annual instead of semi-annual).

12. **Section 6.1, Groundwater Monitoring Systems:** Currently the site has five monitoring wells which is a small number compared to most Class 1 facilities. To assure adequate groundwater monitoring at the site, the SWMD requests two additional wells to be installed as part of the monitoring system. The two additional wells include: 1) one well near the northwest corner of the landfill and 2) one well at the north property boundary near gas probe GMP-7. The well near the northwest corner of the landfill should be between the Class 1 landfill stormwater pond and the Class 4 landfill. Please provide the details for installing these new wells, including the anticipated screen elevations and depths; also a map showing more exact proposed well locations.

Response: *Most of the Class 1 facilities that have more monitoring wells appear to be larger landfills than the Morrilton facility or have installed additional wells in association with being placed in assessment monitoring. The Ozark Ridge Landfill routinely monitors a limited list of parameters at five monitoring wells on an annual basis and the Two Pine Landfill monitors a limited list of parameters at four monitoring wells on a semi-annual basis. The Helena-West Helena Landfill, that is slightly larger than the Morrilton Landfill, samples five monitoring wells.*

As discussed previously, EPA recommends a FWFPR of 5% or less. Increasing the number of monitoring wells increases the FWFPR. Therefore, adding monitoring wells should only be considered if absolutely necessary to adequately monitor conditions at the site and eliminate spatial data gaps. FTN believes that one well installed in the general area described by the ADEQ comment above will adequately monitor groundwater quality in that area. Site conditions and appurtenances will restrict placement of the well and a site visit will be necessary before presenting a proposed location. Details of the proposed location and construction of this well will be provided in separate correspondence.

Enclosed please find a CD that contains the revised referenced documents. If you have any questions regarding this submittal, please do not hesitate to contact me or Dianne Lincicome, PE, PG, at (501) 225-7779.

Respectfully submitted,
FTN ASSOCIATES, LTD.

Paul Crawford, PE, PG
Senior Project Manager

PWC/hlf

Enclosure

CC: The Honorable Bobby Kirby; Mayor, City of Morrilton (with hard copies of referenced revisions)
Eugene Edwards; City of Morrilton Landfill Manager (without enclosure)
Masoud Arjmandi; Arkansas Department of Environmental Quality (without enclosure)
Michael Robinson; Arkansas Department of Environmental Quality (without enclosure)

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[1] US EPA. 1992 Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Draft Addendum to Interim Final Guidance, Office of Solid Waste Permits and State Programs Division, US Environmental Protection Agency, Washington, D.C.

OPERATING PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

REVISED
JULY 14, 2008

OPERATING PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

Prepared for

City of Morrilton
210 North Moose Street
Morrilton, AR 72110

Prepared by

FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, AR 72211

FTN No. 4490-100

REVISED
July 14, 2008

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1.0 INTRODUCTION

1.1 General Information

1.1.1 Site Background

This Operating Plan provides operating and maintenance procedures for the City of Morrilton Class 1 Landfill (the Landfill). The solid waste management facility is located in Conway County, about 2 miles southeast of Morrilton. The location of the facility is shown on Figure 1.1. Local natural topography generally consists of relatively flat to rolling terrain. The Landfill is located in a rural area and is generally surrounded by wooded land and some rural residences.

The city of Morrilton is the owner and operator of the landfill facility.

The Landfill was originally permitted in June 1991. The permitted landfill area is located as shown on Figure 1.2. As of April 2008, waste had been placed in Cells 1 through 4, with remaining permitted capacity in each constructed cell except Cell 1.

1.1.2 Purpose

This plan has been prepared in association with a Permit Modification Application that includes a vertical expansion of the Landfill that increases the permitted capacity of the Landfill from about 1,328,600 cubic yards (cy) to 2,481,000 cy. This document also reflects changes that have been incorporated to comply with the updated Arkansas Pollution Control and Ecology Commission (APCEC) Regulation No. 22 (Regulation No. 22) (April 2006). This manual directs the operation of the landfill facility in accordance with all required permits and regulations.

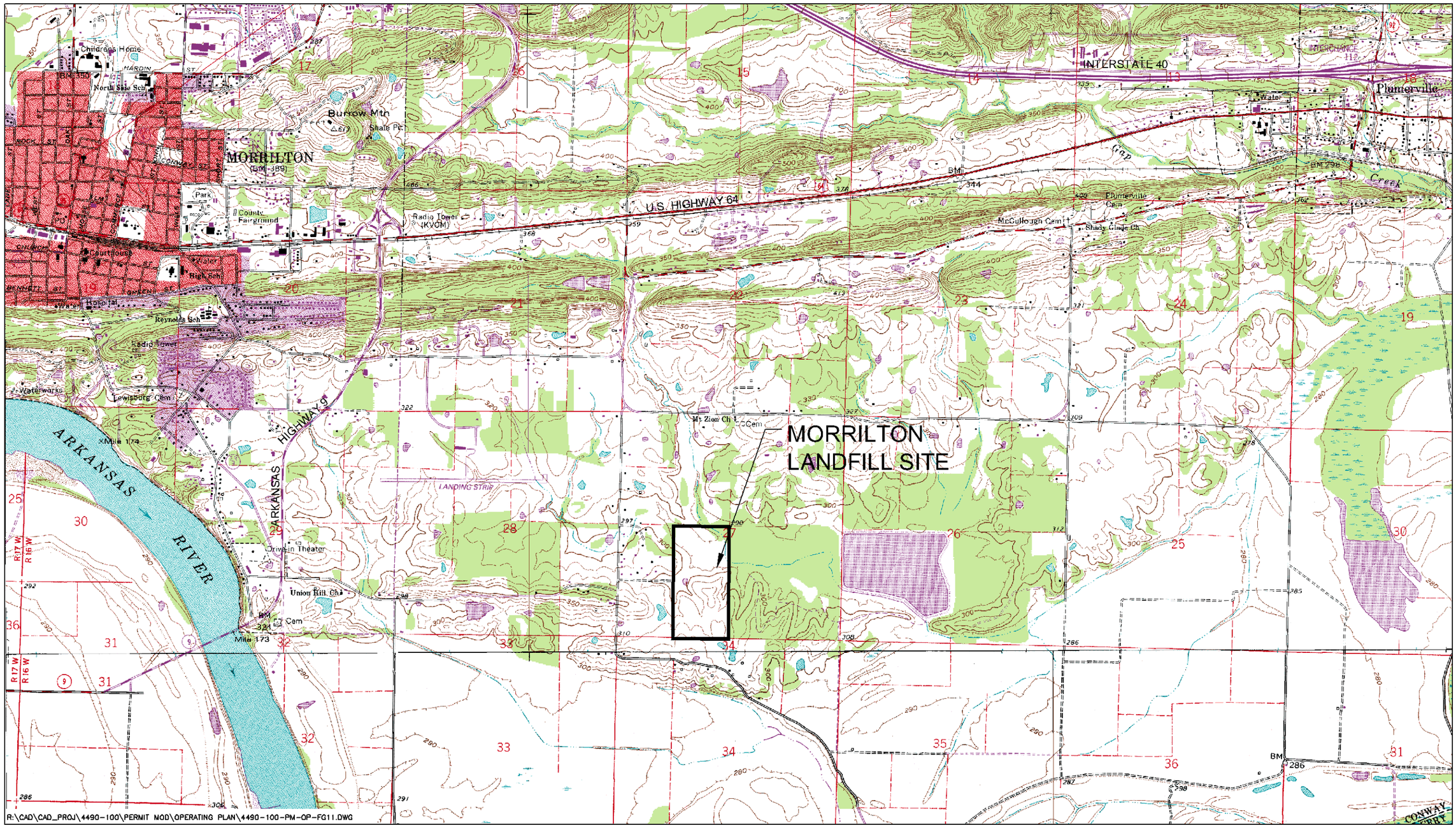


Figure 1.1. Site location map.

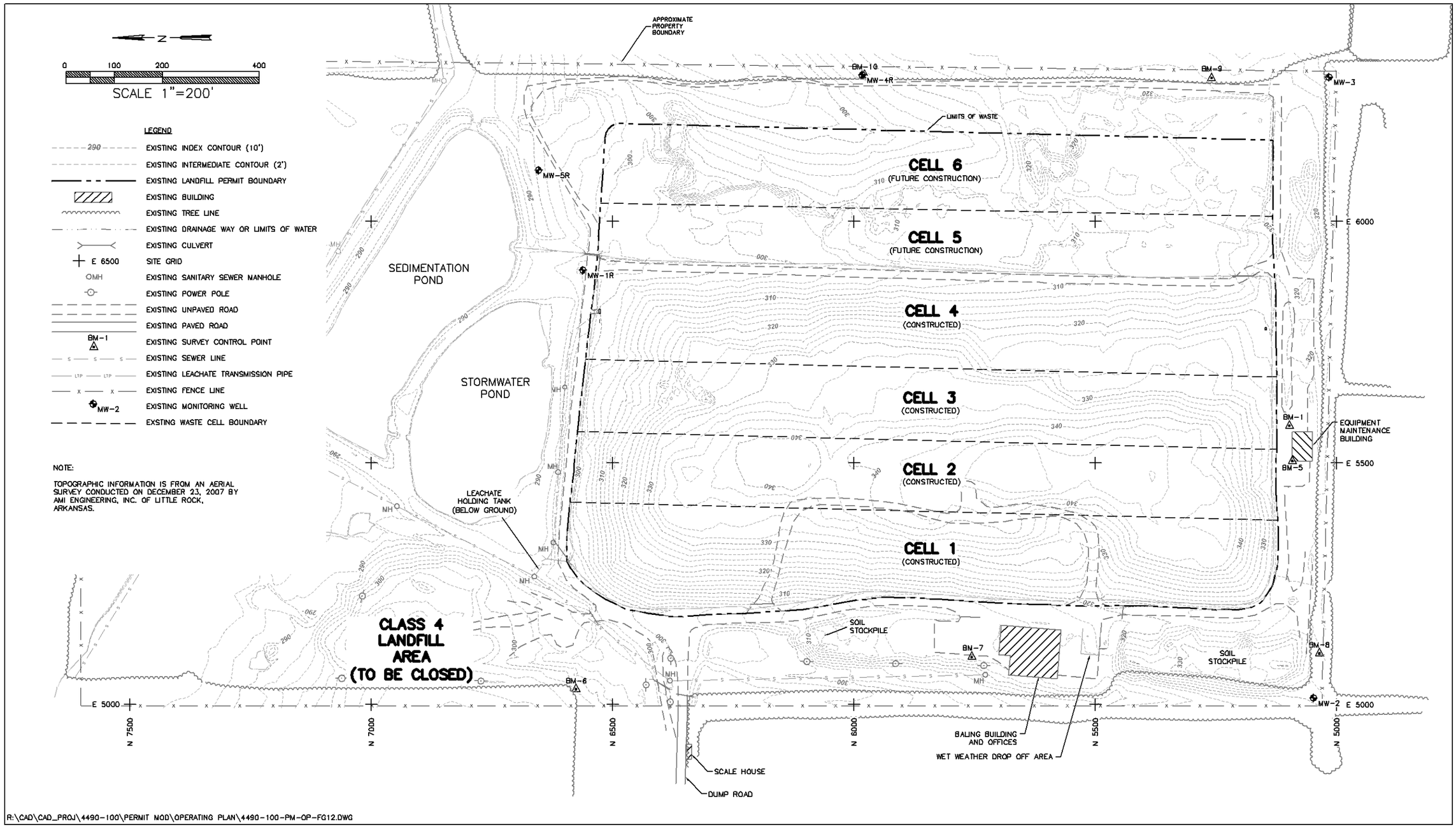


Figure 1.2. Existing conditions.

1.1.3 Scope

This document has been prepared to assist all who have a part in the operation and maintenance of the landfill facility. This document includes procedures for the following:

1. Site development;
2. Waste disposal;
3. Inspection and maintenance;
4. Health and safety;
5. Emergency response and contingency action;
6. Administrative requirements;
7. Landfill closure; and
8. Landfill post-closure.

This document is divided into 11 sections. A brief description of these sections is provided below.

1. Section 1.0 – Introduction: provides general information regarding the landfill facility and this document;
2. Section 2.0 – General Operating Procedures: provides operating information for the landfill facility such as landfill equipment and personnel requirements, hours of operation and signage, access control, waste screening procedures, asbestos disposal, prohibited activities, and survey control;
3. Section 3.0 – Landfill Operating Procedures: provides an explanation of the operating and maintenance procedures specifically related to the landfill area;
4. Section 4.0 – Stormwater Management System Procedures: provides an explanation of the operating and maintenance procedures for the stormwater management system of the landfill area;
5. Section 5.0 – Groundwater and Explosive Gas Monitoring: provides a brief summary of the groundwater monitoring system;
6. Section 6.0 – Leachate Collection and Transmission: describes the leachate collection and transmission system;
7. Section 7.0 – Inspection and Maintenance: explains the methods for conducting periodic inspections of the various facilities associated with the Landfill;
8. Section 8.0 – Health and Safety: describes possible health-related hazards, abatement procedures, and emergency response procedures;
9. Section 9.0 – Recordkeeping and Reporting: provides an explanation of the facility permanent operating record (POR) system and reporting procedures;

10. Section 10.0 – Closure Plan: explains the procedures associated with the Landfill Closure Plan; and
11. Section 11.0 – Post-Closure Care Plan: describes the post-closure care procedures for the landfill facility.

1.1.4 Relationship to Other Facility Documents

This document will guide the operation and maintenance of the landfill facility. It should be used in connection with the following supporting documents to ensure efficient and effective operation of the solid waste facility:

- *Title 40 Code of Federal Regulations* (CFR) *Part 258 (Subtitle D)*;
- *APCEC Regulation No. 22 – Solid Waste Management Rules* (April 2006 or current);
- *Solid Waste Disposal Facility Criteria - Technical Manual* (United States Environmental Protection Agency (USEPA) November 1993 or current); and
- *Permit Modification Application* (May 2008).

This document will be updated over time to reflect current operations and regulations. Revisions to this document shall be submitted to the Arkansas Department of Environmental Quality (ADEQ) for review and approval. ADEQ may require that the changes be accomplished through permit modification prior to implementation. All applicable requests, approvals, and other correspondence will be maintained in the facility POR.

1.1.5 Operating Permit

The city of Morrilton was issued an operating permit by ADEQ in June 1991 to construct and operate a Class 1 landfill. A copy of the current permit (No. 0257-S) is included in Appendix A of the May 2008 Permit Modification Application. This document is part of a Permit Modification Application that is intended to expand the permitted area of the Landfill.

1.2 Facility Description and Design

The landfill facility has been designed for the disposal of nonhazardous household, commercial, and industrial solid waste, as defined in Regulation No. 22, and small quantities of conditionally exempt hazardous wastes. The design of the disposal facility was developed to comply with Regulation No. 22 standards for Class 1 landfills. The following sections outline the design concept for the solid waste management facility.

1.2.1 Waste Disposal Area

The proposed landfill design expands the Landfill vertically on the existing permitted disposal footprint and will increase the permitted capacity from about 1,328,600 cy to 2,481,000 cy.

The Landfill consists of six waste cells, of which four (Cells 1 through 4) have been previously constructed and contain waste (Figure 1.2). Future Waste Cells 5 and 6 have been designed similarly to the previous cells and will have composite bottom liner systems and leachate collection systems (Figure 1.3). Figure 1.4, Development Plan, shows the proposed development for the Landfill.

The proposed final grade of will be approximately 410 ft National Geodetic Vertical Datum of 1929 (NGVD). The landfill side slopes have been designed to have a maximum grade of 25% (4:1) and a minimum grade of 5% (20:1). The final form of the Landfill will consist of one large mound approximately 100 to 110 ft above existing ground surface (Figure 1.5).

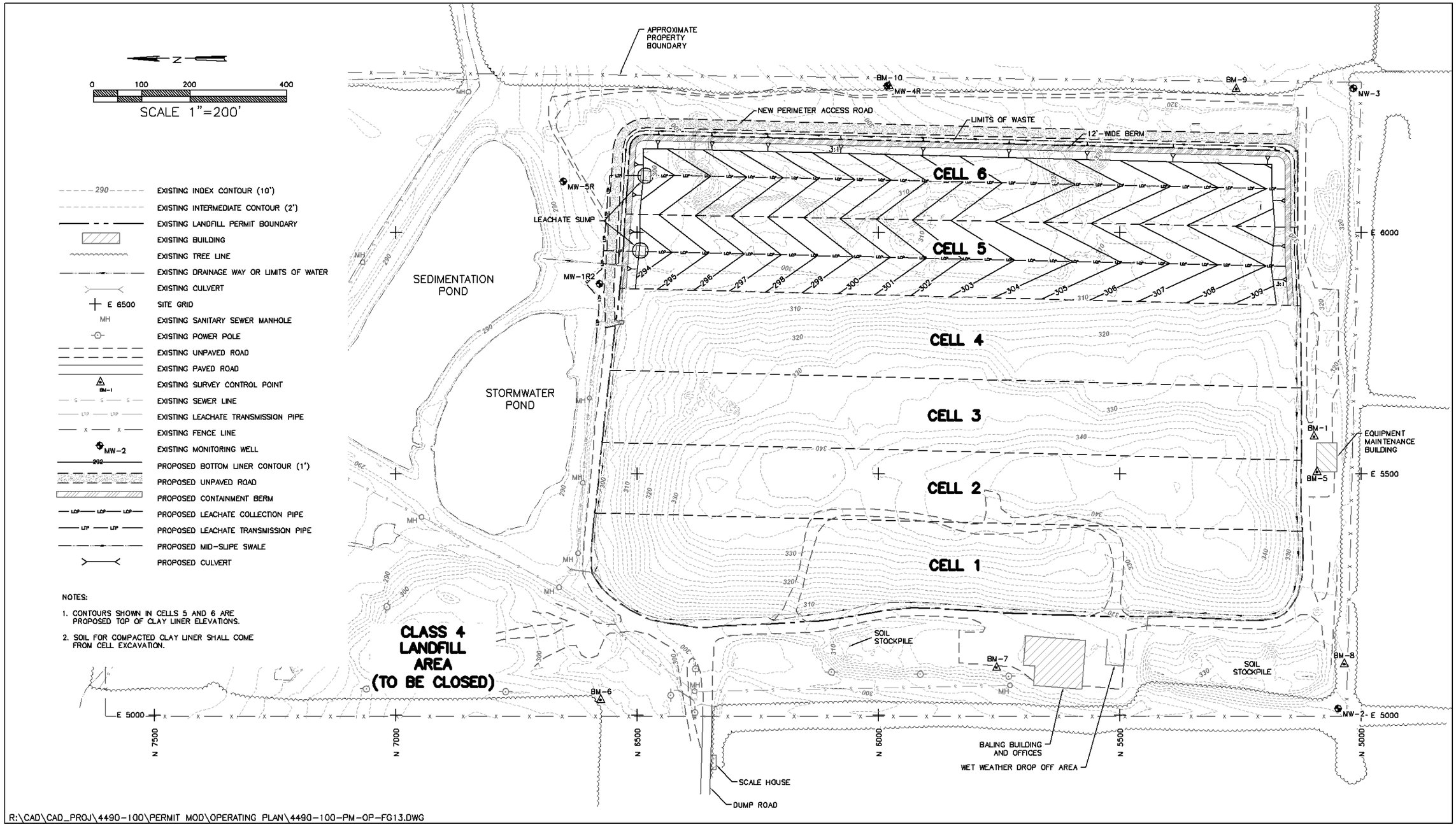
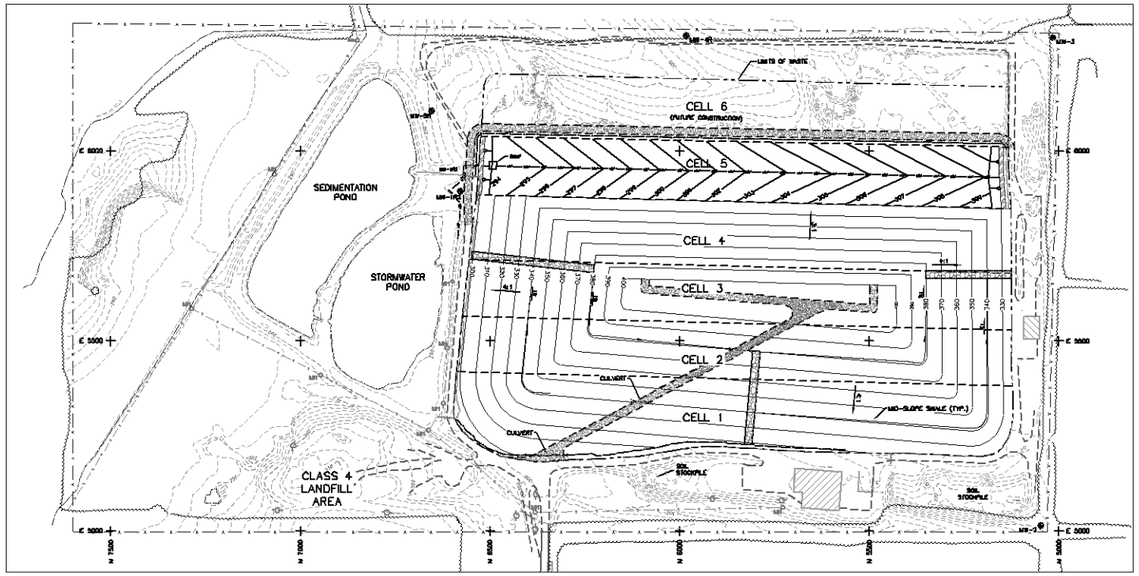
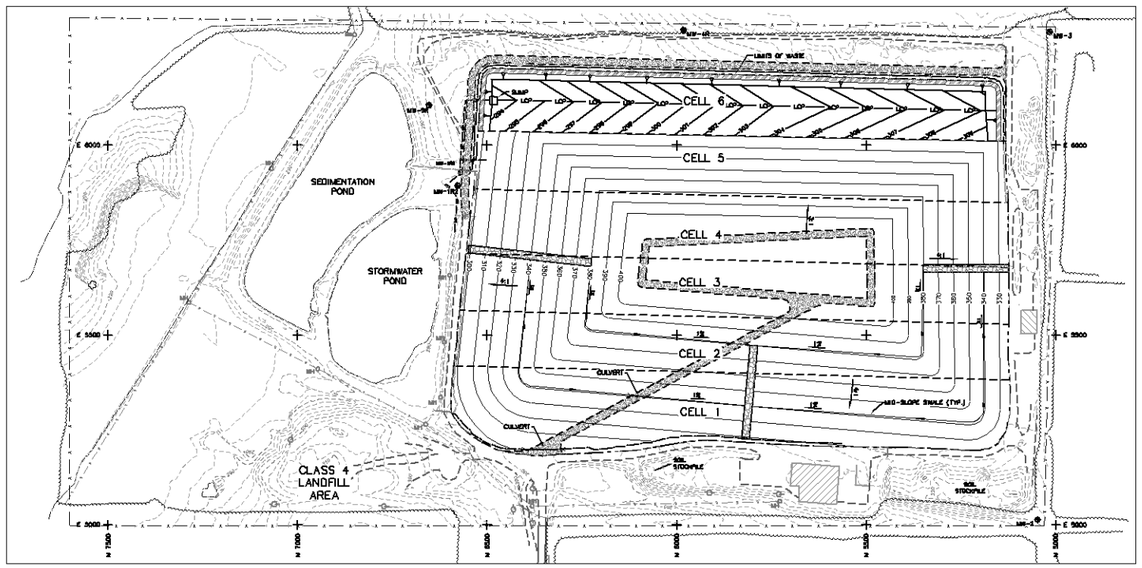


Figure 1.3. Bottom liner plan.



CELLS 1–4 PARTIALLY FILLED, CELL 5 OPEN



CELLS 1–5 PARTIALLY FILLED, CELL 6 OPEN

N

0 200 400 800

SCALE 1"=400'

LEGEND

290	EXISTING INDEX CONTOUR (10')
	EXISTING INTERMEDIATE CONTOUR (2')
	EXISTING LANDFILL PERMIT BOUNDARY
	EXISTING BUILDING
	EXISTING TREE LINE
	EXISTING DRAINAGE WAY OR LIMITS OF WATER
	EXISTING CULVERT
E 6500	SITE GRID
OMH	EXISTING SANITARY SEWER MANHOLE
	EXISTING POWER POLE
	EXISTING UNPAVED ROAD
	EXISTING PAVED ROAD
BM-1	EXISTING SURVEY CONTROL POINT
LTP	EXISTING LEACHATE TRANSMISSION PIPE
X	EXISTING FENCE LINE
MW-5R	EXISTING MONITORING WELL
300	PROPOSED FINAL PERMIT GRADE INDEX CONTOUR
	PROPOSED UNPAVED ROAD
	PROPOSED STORMWATER LETDOWN
	PROPOSED MID-SLOPE SWALE
	PROPOSED CULVERT
	PROPOSED DITCH
LTP	PROPOSED LEACHATE TRANSMISSION PIPE
GMP-7	PROPOSED GAS MONITORING PROBE

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Figure 1.4. Development plan.

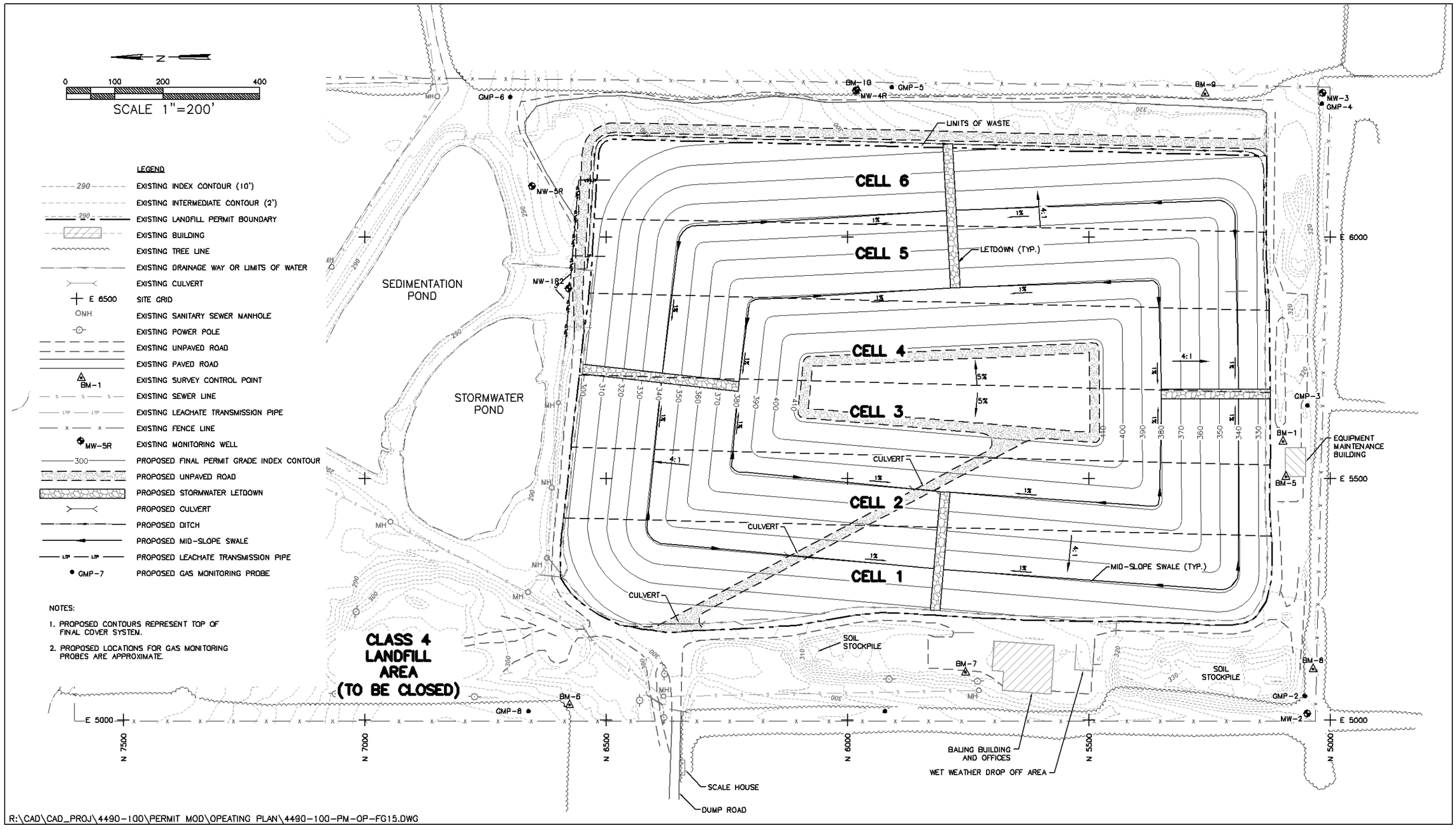


Figure 1.5. Final cover plan.

The Landfill has been designed to include a liner system, a final cover system, a groundwater monitoring system, an explosive gas monitoring system, and a leachate collection system. The bottom liner system of future constructed cells is designed as a composite system consisting of a compacted clay liner and a flexible membrane liner (FML). The compacted clay liner will have a maximum hydraulic conductivity of 1×10^{-7} cm/sec and a thickness of 24 inches. The FML component will consist of a minimum 60-mil high-density polyethylene (HDPE) liner will be placed directly on the compacted clay liner. The final cover system for Cells 1 through 6 includes an 18-inch thick compacted barrier layer, an FML consisting of a minimum 40-mil linear low-density polyethylene (LLDPE) liner, a geocomposite drainage layer, and a 12-inch thick erosion layer consisting of soil vegetated with native perennial grasses. In lieu of the compacted clay liner, an alternative cover system utilizing a geosynthetic clay liner (GCL) may be constructed.

Operating procedures for the Landfill are described in detail in Section 3.0 of this document.

1.2.2 Stormwater Management System

Stormwater run-on and runoff within the landfill area will be directed away from the disposal facility by letdown structures and perimeter ditches that drain to onsite sedimentation ponds. Diversion berms, letdown structures, erosion control devices, and prompt seeding of the completed waste cells will reduce the potential of erosion on the finished side slopes.

Operating procedures for the stormwater management system are described in more detail in Section 4.0 of this document.

1.2.3 Groundwater Monitoring System

The Landfill currently has a groundwater monitoring system that includes two upgradient and three downgradient wells. Additional information on the system is provided in Section 5.0 of this document and in the Sampling and Analysis Plan (Appendix I of the Permit Modification Application).

1.2.4 Leachate Collection and Transmission System

The landfill design includes a leachate collection and transmission system for all existing and proposed waste cells. The system includes a sump area and pumping system for each cell and dual-contained leachate transmission pipeline that discharges to the city's sanitary sewer system. Additional information on the leachate collection and transmission system is provided in Section 6.0 of this document.

2.0 GENERAL OPERATING PROCEDURES

The operating procedures in this section address the basic operating procedures for the entire landfill facility. They are intended to serve as a reference and directive associated with efficient, effective operation and use of the waste disposal area.

2.1 Landfill Personnel and Equipment

2.1.1 Operator Licensing

Operations associated with daily landfill functions are performed under the direction of a licensed landfill operator. Licensing, training, and certification updates comply with the requirements of APCEC Regulation Nos. 22 and 27.

Copies of certifications are kept in the facility's POR located in the Landfill's Scale House. The city of Morrilton currently employs nine licensed operators at the Landfill.

2.1.2 Equipment and Personnel Requirements

Table 2.1 lists the typical equipment and personnel associated with the operation of the Landfill. The equipment and number of personnel at the Landfill will vary depending on the daily activities. During periods of intense landfill activity, such as excavation of a new waste cell or closure of a waste cell, additional equipment may be obtained from outside sources.

2.2 Hours of Operation and Signage

The Landfill's normal operating hours are between 7:00 a.m. and 3:00 p.m., Monday through Friday, and between 8:00 a.m. and 12:00 p.m. on Saturday. At least one licensed landfill operator is present on site during disposal operations.

Table 2.1. Landfill equipment and personnel requirements.

Equipment/Personnel	Typical Quantity
Equipment	
Waste Compactor	1
Dozer	2
Dump Truck	1
Excavator (Track Hoe)	1
Bobcat	1
Forklift	1
1-Ton Pickup	1
Pickup	3
Personnel	
Landfill Manager	1
Scale House Operator	1
Landfill Operators	4

A sign with the name of the facility, permit number, emergency phone number, and hours of operation is posted on Dump Road. There are additional signs within the landfill facility directing traffic to the working face.

2.3 Access Control

Access to the Landfill is controlled and managed by employees of the city of Morrilton. Disposal vehicles currently access the Landfill via the main entrance road to the Landfill, located on the northwest corner of the facility. Access to the working face of the Landfill is via permanent perimeter roads around the Landfill. Temporary access roads are constructed on an as-needed basis.

The main entrance road by the Scale House and leading to the office/baling building is an asphalt road. The temporary roads are gravel or dirt roads, depending on the anticipated length of operation. The roads will be maintained as necessary to provide access during periods of inclement weather. Figure 2.1 shows facility access road cross-sections.

Information and/or directional signs are posted to direct traffic to the working face. Landfill operators prohibit any unauthorized access to the landfill area.

2.4 Waste Screening Procedures

Landfill operators are trained to recognize acceptable wastes, and procedures are in place to prevent disposal of unauthorized wastes at the Landfill. Upon arrival at the facility, landfill staff will initially screen loads at the gate. If the Scale House Manager or other staff is suspicious of the load, landfill personnel are notified to conduct an inspection of the load. Landfill personnel also perform random inspections of incoming loads to detect and prevent the disposal of regulated hazardous wastes and other unauthorized wastes.

The facility Hazardous and Unauthorized Waste Exclusion Plan (May 2008) outlines the training methods for waste screening and lists acceptable and unacceptable wastes, inspection procedures, recordkeeping procedures, and notification procedures. A copy of the Hazardous and Unauthorized Waste Exclusion Plan is located in the facility POR.

2.5 Asbestos Disposal

Asbestos handling and disposal will be conducted in accordance with APCEC Regulation No. 21 (Arkansas Asbestos Abatement Regulation). Landfill personnel should be aware of the potential hazards associated with asbestos. Friable materials have the physical characteristic of flaking, crushing under low pressure, and pulverizing into a powder. Therefore, materials containing friable asbestos are of particular concern with respect to health hazards and the airborne particulate transport of asbestos that can potentially be inhaled. Nonfriable materials retain the physical characteristic of staying intact under normal conditions, and the associated health hazard is lower. The requirements of this section do not apply to Category I nonfriable asbestos-containing material (ACM) waste and Category II nonfriable ACM waste that did not become crumbled, pulverized, or reduced to powder. These types of ACM are defined as follows:

- **Category I Nonfriable ACM –** Asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1% asbestos as determined using the method specified in Appendix E, Subpart E, 40 CFR Part 763, Section 1, Polarized Light Microscopy; and
- **Category II Nonfriable ACM -** Any material, excluding category I nonfriable ACM, containing more than 1% asbestos as determined using the methods

specified in Appendix E, Subpart E, 40 CFR Part 763, Section 1, Polarized Light Microscopy that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Because of the potential for airborne particulate transport of asbestos, each load of ACM should be thoroughly inspected and procedures should be implemented to eliminate exposure to friable material. If conditions are present that present an immediate health threat, landfill personnel will immediately request that the transporter notify appropriately trained professionals to handle and contain the material.

When asbestos disposal is planned, landfill personnel will implement the following procedures:

1. The Landfill requires at least 24 hours' notification that a hauler intends to deliver ACM to the Landfill;
2. The ACM hauler provides the Landfill with the following information:
   a. Name of transporter and telephone number;
   b. Source of asbestos, condition, and estimated volume;
   c. Results from any analytical testing of the material; and
   d. Generator name for asbestos.
3. Landfill personnel will make a determination of whether the ACM can be disposed during the next day of operations. If disposal space is available, landfill personnel will schedule the time the hauler should arrive at the facility; and
4. Landfill personnel shall verify the exact location for disposal and ensure the location meets the requirements for disposal of ACM. Verification shall occur prior to the hauler's arrival onsite.

Upon delivery of the load containing ACM, the following steps are taken:

1. Verification of the data obtained in the initial contact will be made at the time of arrival. Discrepancies may result in rejection or delay of disposal;
2. Trucks entering the landfill site will be inspected and should be enclosed such that ACM shall not escape to the outside air. Landfill personnel will look for evidence of improper packaging and disposal conditions that may lead to exposure for landfill personnel;
3. ACM arriving onsite shall have been properly treated and contained to limit exposure. Wetting methodology, containerization, and packaging will be in

compliance with the requirements of 40 CFR Part 61. Appropriate Occupational Safety and Health Administration (OSHA) and generator identification labels shall be firmly attached to each individual container;

4. ACM must be placed in leak-proof containers or wrapping and securely tied or sealed in a manner to prevent the escape of friable or particulate asbestos to the outside air. Materials that include metal or other sharp objects must be placed in sealed metal drums;
5. Landfill personnel shall obtain a count of the number and types of containers in each load and will record whether the transporting vehicle displays the appropriate placards stating that the vehicle is transporting asbestos;
6. Landfill personnel shall log the appropriate information to identify a specific load, the characteristics and quantity of the load, and the location of disposal (including depth and area) on a map and on the disposal log form that is included in Attachment 1. This form will accompany the disposal manifest or "Waste Shipment Record" (included in Attachment 1) for a load; and
7. During each 24-hour period of landfill operations, the asbestos for that day's disposal shall be placed at the toe of the slope of the working face of the Landfill. Cover must not be less than 6 inches of compacted non-asbestos-containing soil. Placement and cover of asbestos waste shall be performed in such a way to prevent the rupture of the containers holding the ACM.

Records relating to asbestos disposal will be maintained in the facility POR in accordance with APCEC Regulation No. 21 and will be available for inspection by ADEQ.

2.6 Prohibited Activities

The following activities are prohibited at the Landfill:

1. Any scavenging of materials, as defined in Regulation No. 22;
2. Any feeding of farm or domestic animals;
3. Depositing waste in standing water; and
4. Open burning, as defined in Regulation No. 22.

2.7 Litter Control

The Landfill accepts waste that could cause blowing litter under windy conditions. Litter at the site will be controlled by the application of daily cover, the use of temporary litter crews to collect wind-blown litter, and the installation of litter fences, as necessary.

2.8 Survey Control

Horizontal and vertical control points must be maintained during the life of the Landfill. These points are necessary so the Landfill can be constructed and filled according to the design of the facility. Figure 2.2 identifies the locations of the permanent survey control points and the grid system that has been established for landfill construction and operation. If any of the permanent monuments for the site are damaged or destroyed they shall be re-established.

Temporary waste cell markers that delineate the limits of the active waste area are installed during construction of the landfill areas. Theses markers are located near the waste cell boundaries. Landfill grid markers, indicating the coordinates of the landfill grid system, are installed at select locations near the perimeter of waste cells as they are constructed. Figure 2.3 identifies a typical landfill grid marker.

The Landfill is surveyed annually to document fill progression, evaluate remaining airspace, and to construct a topographic contour map of the site.

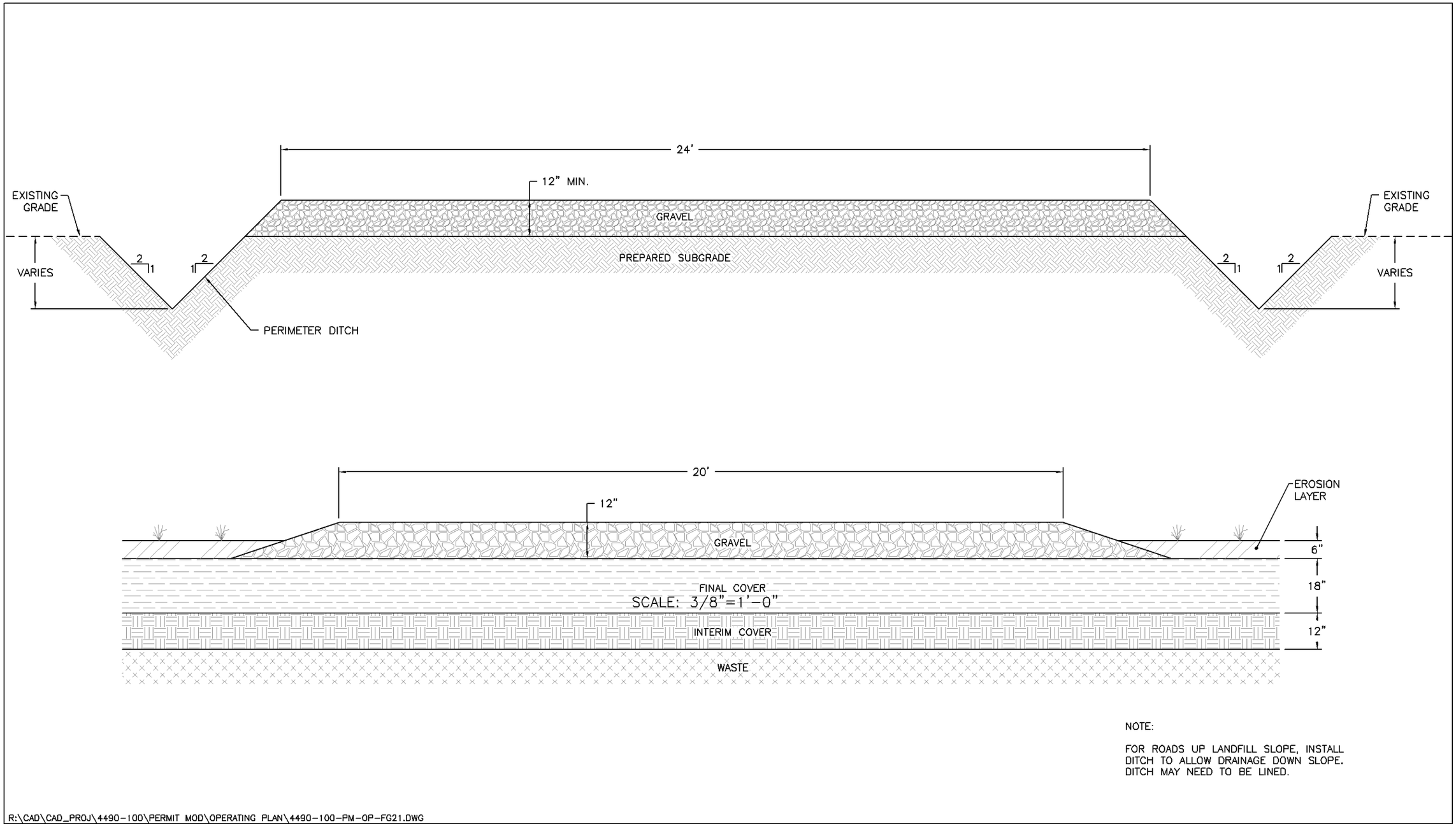


Figure 2.1. Access road details.

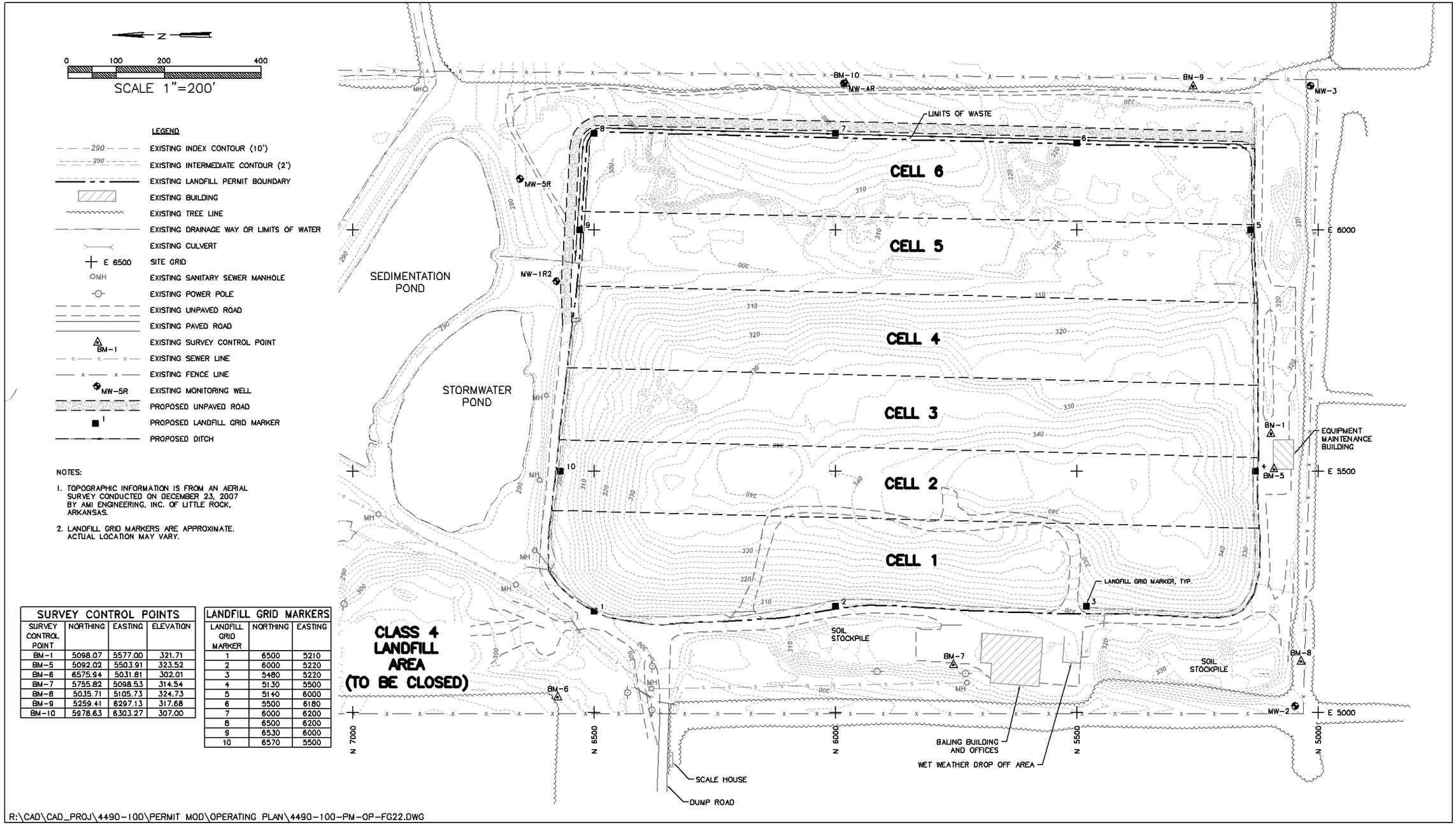
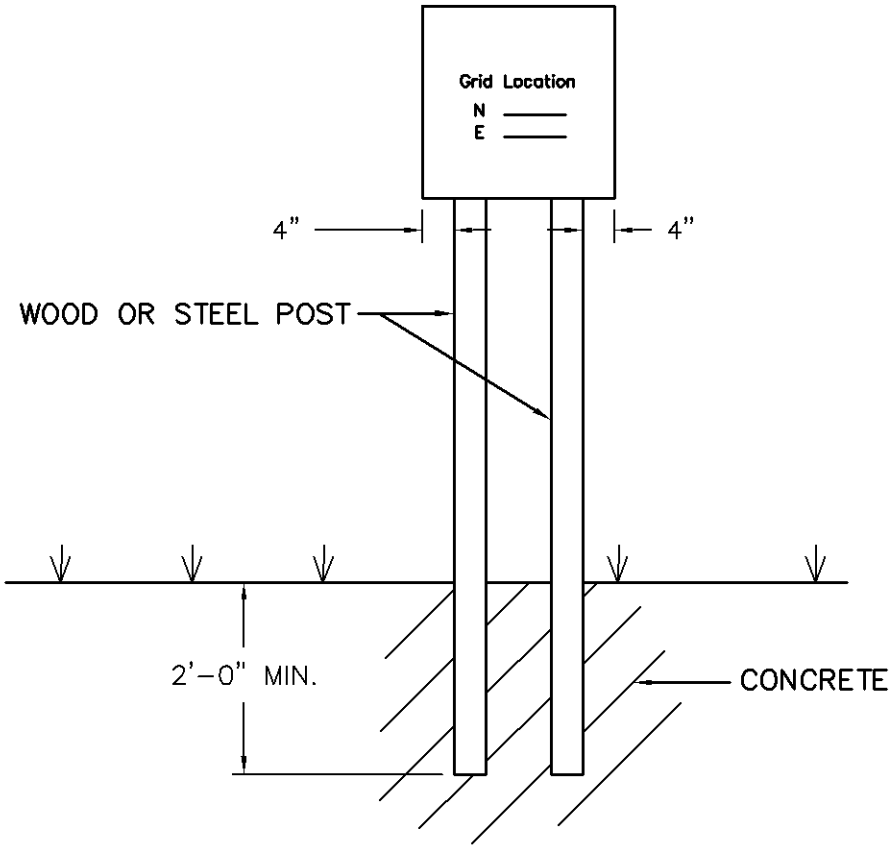


Figure 2.2. Survey control plan.



NOTE: SIGN TO BE MADE TO METAL OR WOOD.

SCALE: N.T.S.

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Figure 2.3. Landfill grid marker.

3.0 LANDFILL OPERATING PROCEDURES

Construction and operation of the Landfill is an ongoing activity throughout its life. Construction often takes place at recurring intervals. Ongoing construction activities include development of new waste areas; repair and expansion of access roads and drainage facilities; waste filling; and installation of the landfill cover system.

This section of the document provides guidance to those individuals involved with the daily operations specifically related to the disposal area of the landfill facility.

3.1 Waste Filling Operations

3.1.1 Placement of Waste

Waste is delivered to the site by both public and private haulers that are licensed by the West River Valley and White River Regional Solid Waste Management Districts.

All wastes are taken directly to the active waste area. An Arkansas-licensed landfill operator is present at the Landfill to direct disposal activities. In accordance with §22.411(c) of Regulation No. 22, the working face size will be confined to the smallest practical area.

The location for disposal of waste from hauling vehicles varies during the life of a waste cell. For the initial waste placement in a new waste cell, the hauling vehicles haul the waste to the bottom area of the cell for disposal. When the elevation of the waste is approximately equal to the original ground surface, but less than the containment berm that surrounds the perimeter of the waste cell, disposal activities are moved to the top of the previously completed cell.

In accordance with §22.411(d) of Regulation No. 22, the landfill operator spreads and compacts the waste in the smallest practical area as it is unloaded.

3.1.2 Configuration and Development of Landfill

The Landfill will be developed as shown by (Figure 1.4).

As of December 2007, waste had been placed in Cells 1 through 4, with remaining capacity in each constructed cell except Cell 1 (Figure 1.2). When Waste Cells 1 through 4 have

reached their maximum proposed permitted elevations, the waste will be graded to the elevations and slopes shown on the Permit Drawings, and final cover will be installed.

The side slopes of the completed cells will be graded to 4 (horizontal) to 1 (vertical) (4:1). The top of the Landfill will be graded to a 5% slope to promote runoff. A perimeter all-weather access road will surround the Landfill and stormwater letdowns will be constructed on each side of the Landfill (Figure 1.5).

In general, a typical waste cell is developed by the following steps:

1. Excavating a new waste disposal area to the depths and dimensions shown on the Permit Drawings. Excavated soils are stockpiled onsite;
2. Constructing a bottom liner system to the dimensions shown on the Permit Drawings and in accordance with the facility Construction Quality Assurance/Quality Control (CQA/QC) Plan. A typical detail of the bottom liner system is shown on Figure 3.1;
3. Grading the area around waste cell and construct diversion berms to minimize run-on into waste cell;
4. Placing initial lift (approximately 10-ft thick) across entire bottom of new cell;
5. Moving disposal activities to top of previously completed and covered waste cell;
6. As the elevation of the waste approaches final capacity of the active waste disposal area, the next disposal area will be excavated and prepared in accordance with the Permit Drawings and the facility's CQA/QC Plan; and
7. Starting the cycle over in subsequent waste area.

Future waste cells will be developed sequentially starting in Cell 5 and proceeding to Cell 6 (Figure 1.4). As of January 2008, the remaining capacity for the Landfill was 595,000 cy. The estimated available disposal volume including the modified capacity (1,152,000 cy) is 1,747,000 cy.

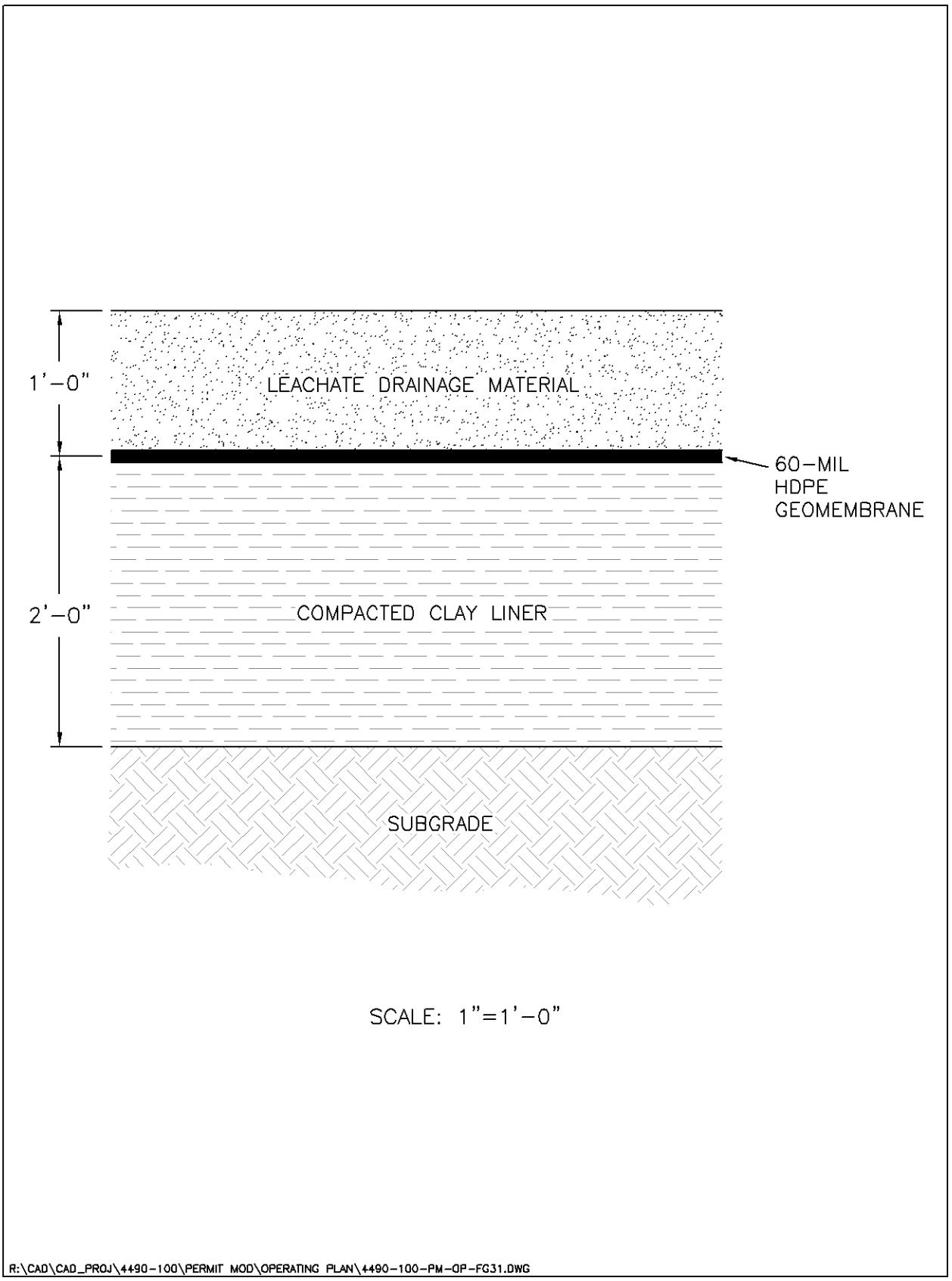


Figure 3.1. Bottom liner system.

3.1.3 Site Capacity and Service Life

The planned maximum final elevation of the Landfill is approximately 410 ft NGVD for The total waste capacity for the Landfill's proposed design is approximately 2,481,000 cy.

Based upon the previous five years' (2003 through 2007) disposal rate for the facility, approximately 6,300 cy of waste are disposed in the Landfill per month, including daily cover. If this disposal rate continues, the estimated service life for the Landfill (including modified capacity) is approximately 23 years.

3.2 Bottom Liner System Construction

Waste Cells 5 and 6 will be constructed with a bottom liner system as shown in the Permit Drawings. The bottom liner system is designed as a composite system consisting of a compacted clay liner and a flexible membrane liner (FML). The compacted clay liner will have a maximum hydraulic conductivity of 1×10^{-7} cm/sec and a thickness of 24 inches. The FML component will consist of a minimum 60-mil HDPE liner that will be placed directly on the compacted clay liner. Figure 3.1 shows the bottom liner system. The clay material for the compacted clay component of the bottom liner will come from excavated onsite soils within the landfill area.

The bottom liner system will be constructed in accordance with the facility's CQA/QC Plan (May 2008). A copy of the CQA/QC Plan is included in Appendix H of the Permit Modification Application.

3.3 Final Cover Placement

Final cover has not been installed for any existing waste cells at the Landfill. The final cover system for the Landfill will meet the requirements of the facility CQA/QC Plan (Appendix H of the Permit Modification Application, May 2008) and the facility Closure and Post-Closure Care Plan (Appendix J of the Permit Modification Application, May 2008). The typical cover system consists of the following configuration from bottom to top (as shown on Figure 3.2):

- Eighteen inches of compacted clay soil with a hydraulic conductivity of no more than 1 x 10^{-7} cm/sec;
- FML consisting of a minimum 40-mil linear low-density polyethylene (LLDPE) liner;
- A double-sided geocomposite drainage layer; and
- A 12-inch layer of soil vegetated with native perennial grasses.

Alternate cover systems may include a GCL system, as shown on Figure 3.2.

The typical cover system will be installed in phases, in accordance with the facility CQA/QC Plan, and generally involves the following activities. As each waste cell is constructed, excavated soils will be placed in designated soil stockpile locations. Construction of the cover system for a completed waste area will be in layers and generally follow the steps below:

1. Constructing the 18-inch thick barrier layer in three 9-inch thick loose lifts by placing the excavated or stockpiled soils across the waste material and then compacting to achieve the required permeability of 1 x 10^{-7} cm/sec and a compacted thickness of 6 inches per lift;
2. Installing the FML after the barrier layer is completed;
3. Installing geocomposite drainage layer over geomembrane;
4. Placing the 12-inch thick erosion layer over the barrier layer and grading;
5. Seeding the erosion layer with native grasses;
6. Surveying the cover system to establish the thickness of cover and surveying any additional features related to the cover system (i.e., stormwater structures, roads, berms, etc.); and
7. Developing a certification report by an Arkansas-registered Professional Engineer which will include a summary of all construction activities, description of installed items and materials used, an "as-built" plan at a scale of one inch equals 100 ft or less, and a summary statement signed and sealed by the certifying professional.

Upon completion of installation of the cover system, erosion control devices such as straw bale check dams, silt fences, or erosion control matting will be installed in areas where excessive erosion may occur such as on side-slopes, discharge locations of stormwater structures and drainage channels (Figures 3.3 through 3.5).

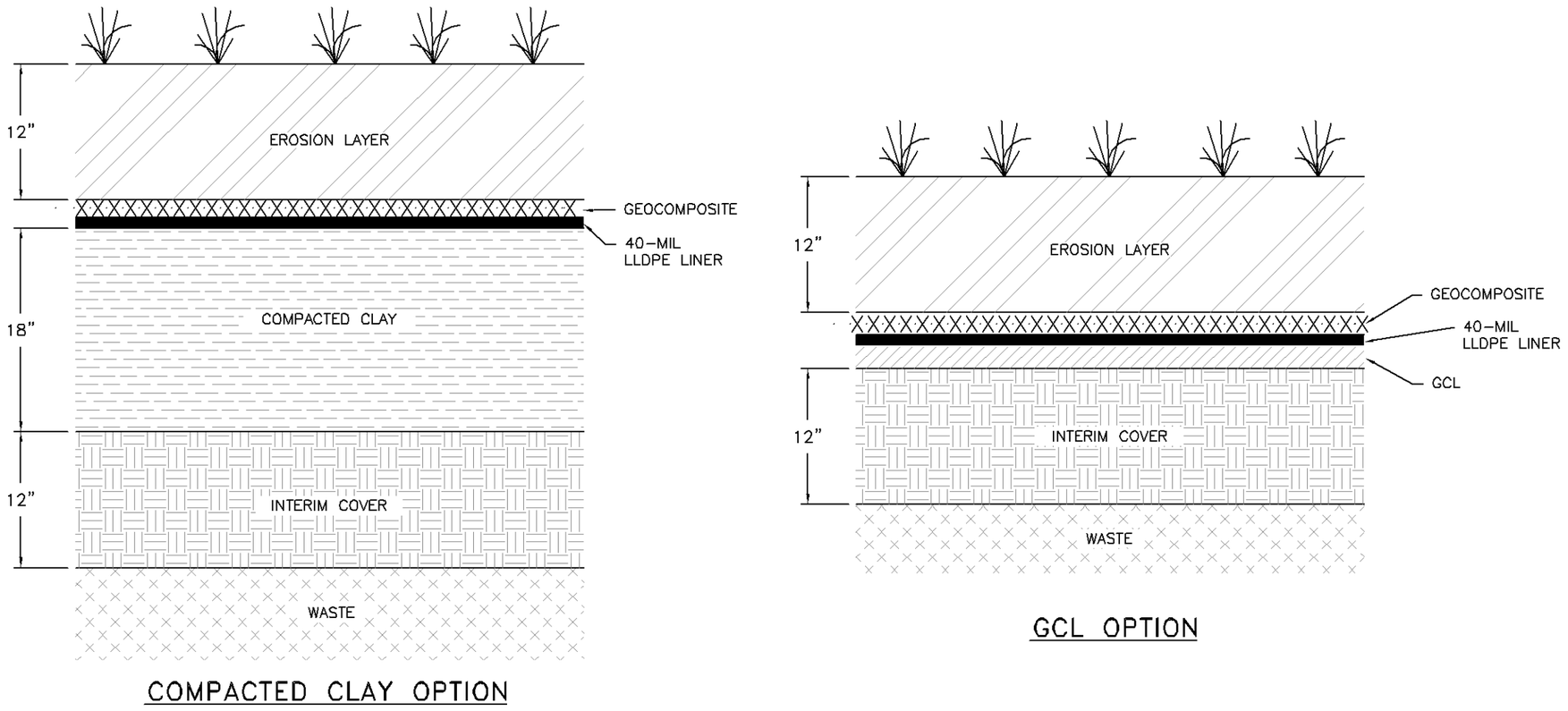
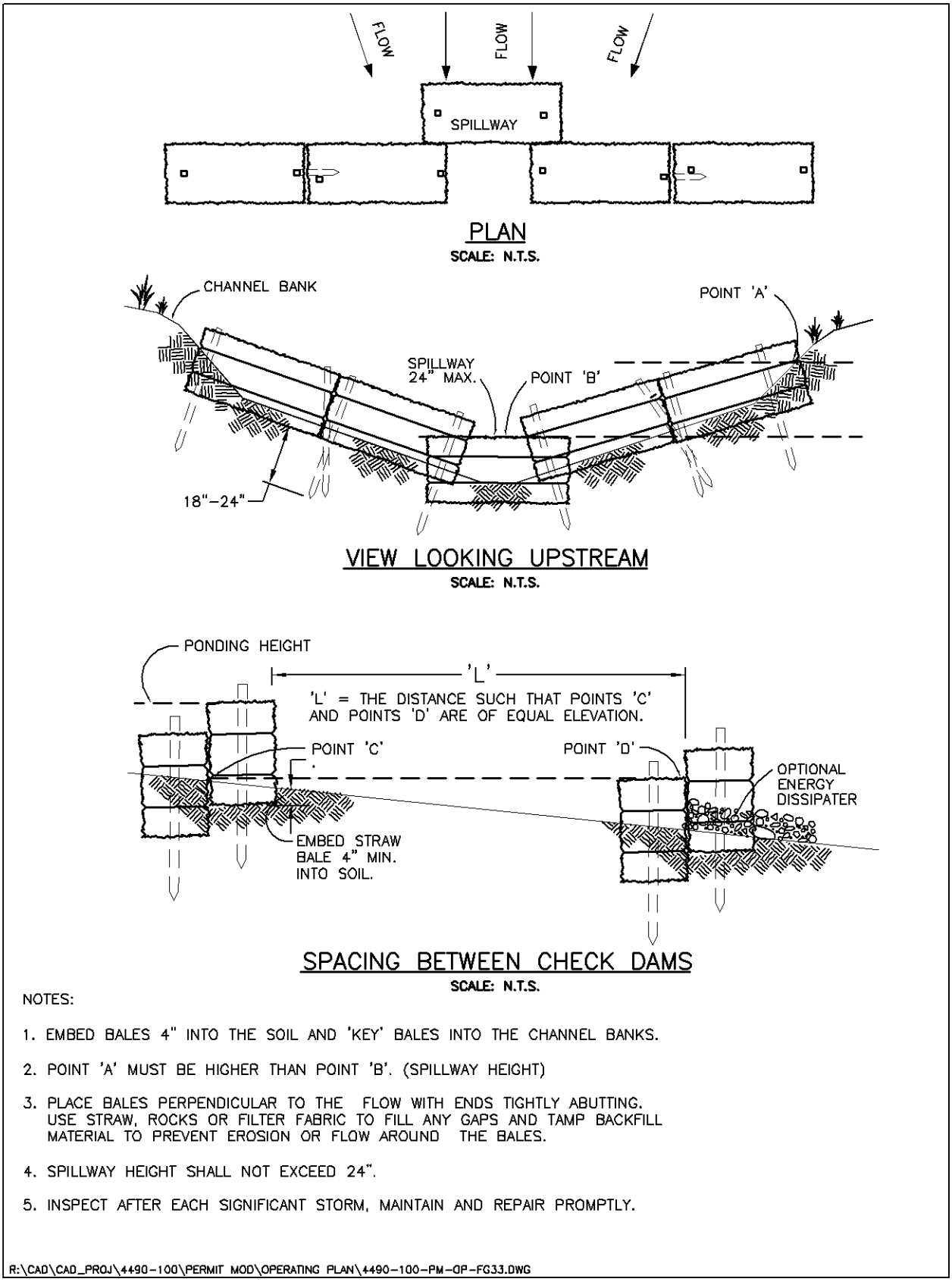


Figure 3.2. Final cover options.

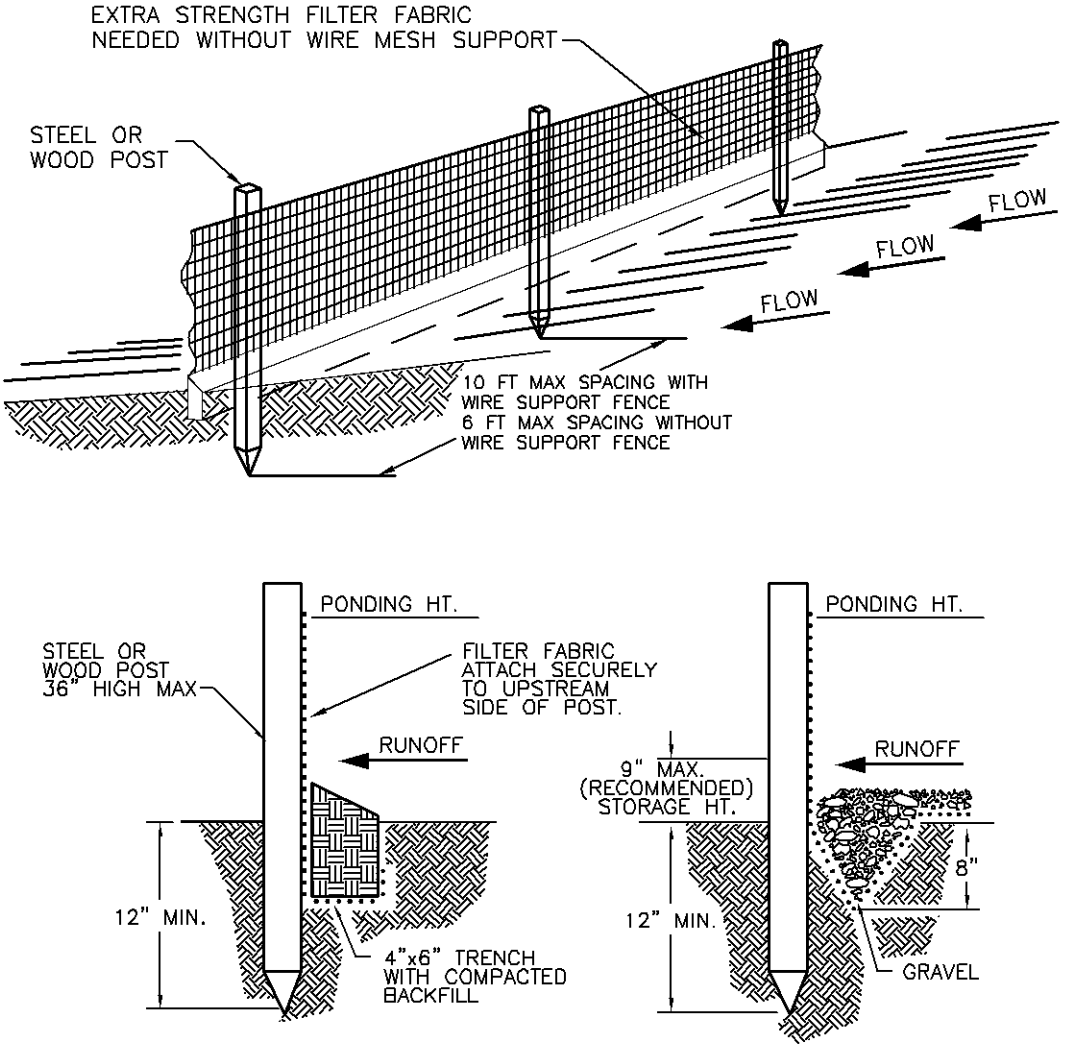


NOTES:

1. EMBED BALES 4" INTO THE SOIL AND 'KEY' BALES INTO THE CHANNEL BANKS.
2. POINT 'A' MUST BE HIGHER THAN POINT 'B'. (SPILLWAY HEIGHT)
3. PLACE BALES PERPENDICULAR TO THE FLOW WITH ENDS TIGHTLY ABUTTING. USE STRAW, ROCKS OR FILTER FABRIC TO FILL ANY GAPS AND TAMP BACKFILL MATERIAL TO PREVENT EROSION OR FLOW AROUND THE BALES.
4. SPILLWAY HEIGHT SHALL NOT EXCEED 24".
5. INSPECT AFTER EACH SIGNIFICANT STORM, MAINTAIN AND REPAIR PROMPTLY.

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Figure 3.3. Straw bale check dam detail.



STANDARD DETAIL
TRENCH WITH NATIVE BACKFILL
NOT TO SCALE

ALTERNATE DETAIL
TRENCH WITH GRAVEL
NOT TO SCALE

NOTE:

1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

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Figure 3.4. Silt fence detail.

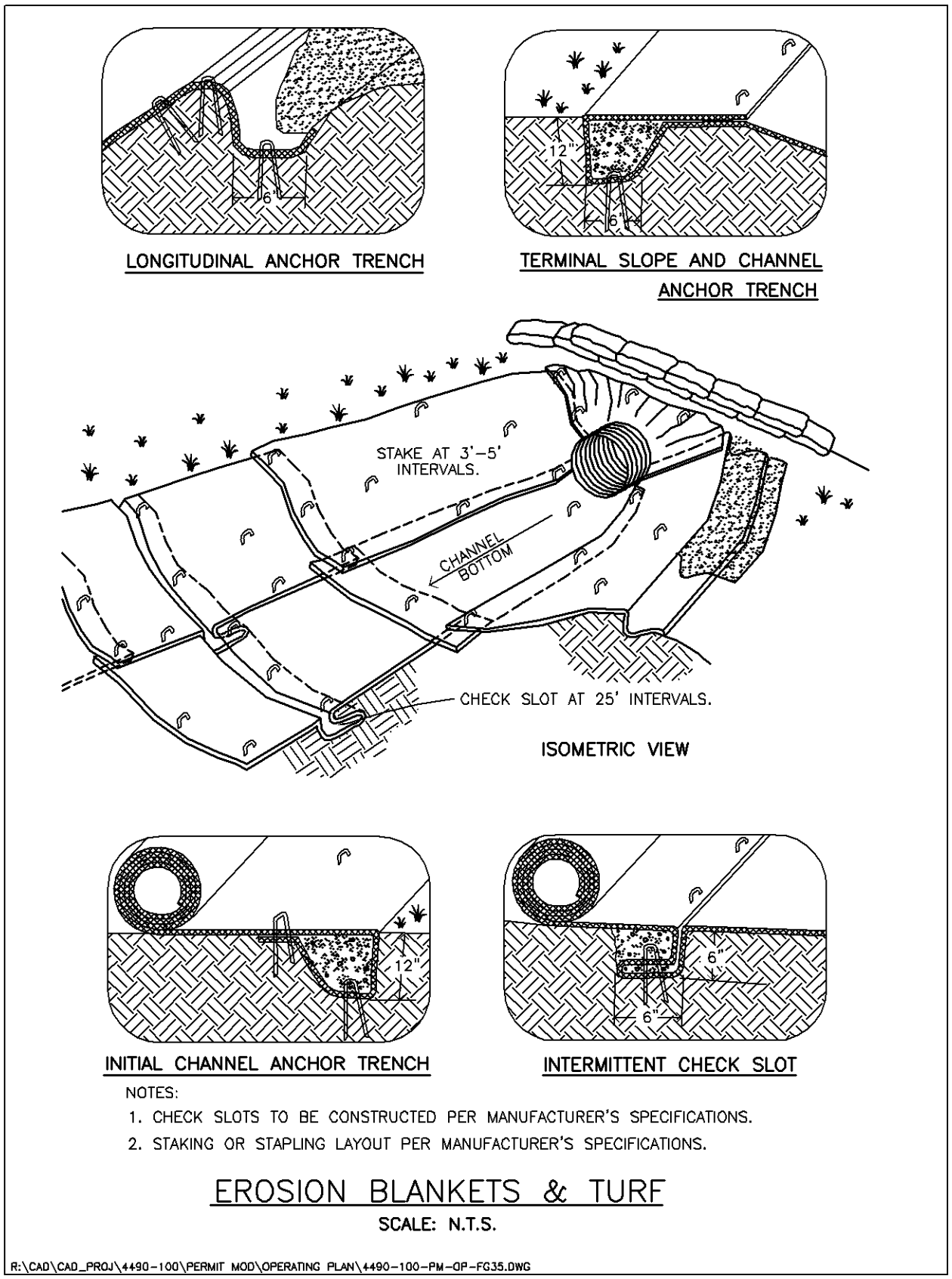


Figure 3.5. Erosion control matting detail.

4.0 STORMWATER MANAGEMENT PROCEDURES

A stormwater management system is used at the landfill site to control run-on and runoff. The system is designed to minimize erosion and promote settling of sediments. The primary erosion and sediment control measure is the presence of a vegetative cover on the finished landfill slopes provided by seeding. Other stormwater management system components include stormwater ditches, stormwater letdown structures, and mid-slope swales (Figures 4.1 through 4.3), and stormwater detention/sedimentation ponds (Figure 1.2).

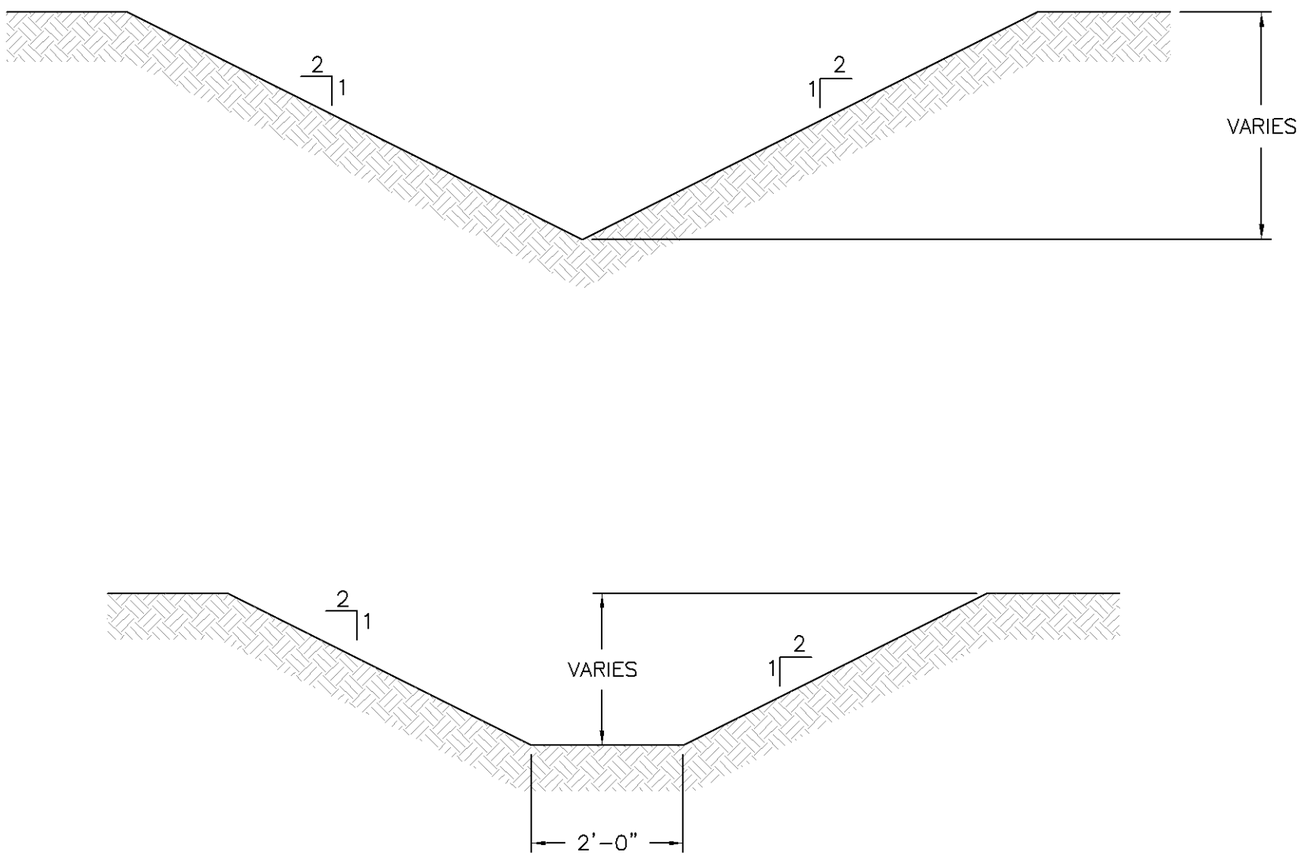
The surface of the working portion of the Landfill will be contoured to minimize surface run-on or flow into or through the working face. Stormwater runoff outside the active waste area is directed away from the active cell(s) by a combination of letdowns, diversion berms, and perimeter ditches and then routed to onsite sedimentation ponds. The water is discharged from the site and monitored under general National Pollutant Discharge Elimination System (NPDES) Permit No. ARG160001. In addition to prompt seeding of completed waste areas, diversion berms and letdowns help reduce the potential of erosion of the finished landfill slopes.

Erosion and sediment control measures such as silt fences, hay bale check dams, and erosion control matting may be used to reduce the potential for excessive sedimentation problems.

4.1 Water Conveyance

Peak flows from the 24-hour, 25-year storm will be contained by the facility's stormwater detention ponds.

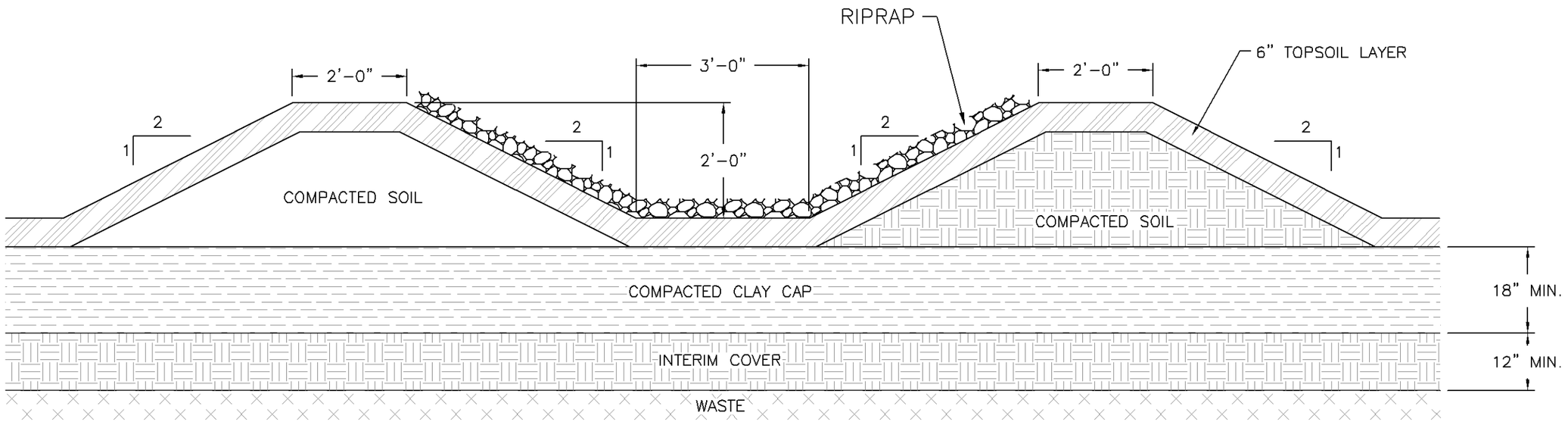
All watercourses are designed to reduce erosion. Ditches and swales will be grass-lined, and will have a maximum gradient of 3%. Steeper slopes will use rock-lined ditches or letdowns.



SCALE: N.T.S.

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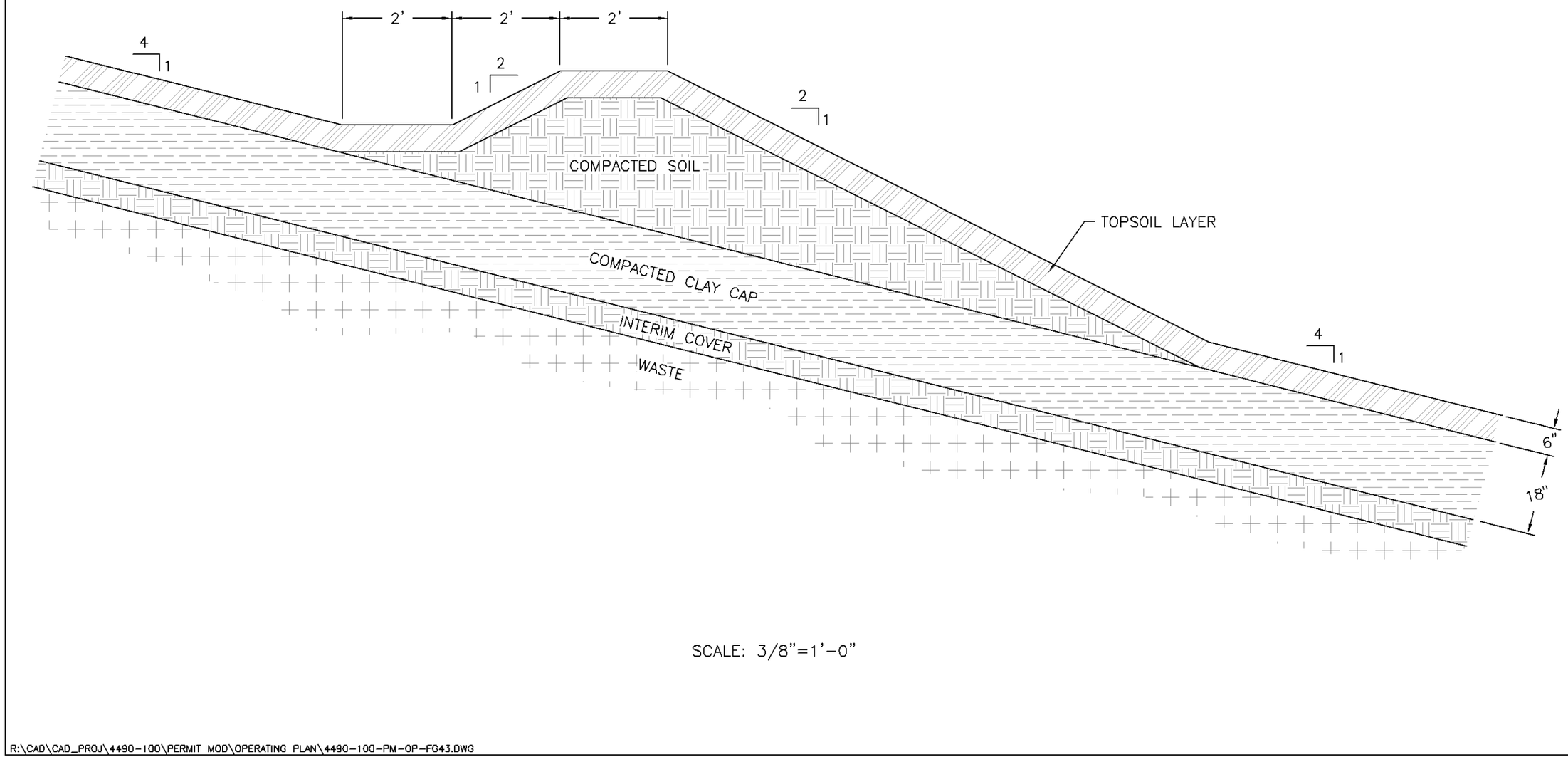
Figure 4.1. Stormwater ditches.



SCALE: 3/8"=1'-0"

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Figure 4.2. Stormwater letdown structure.



SCALE: 3/8"=1'-0"

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Figure 4.3. Mid-slope swale.

4.2 NPDES Monitoring

Stormwater runoff from the landfill facility is collected in the sedimentation and stormwater ponds. The collected water is discharged directly to a city sanitary sewer pipeline and there are no discharges to a receiving body of water. Discharge monitoring reports are filed with ADEQ reporting no discharge.

4.3 Seeding

Seeding of the landfill cover shall be conducted in the spring and fall (typically during February through April and September through November) on recently completed waste cells and areas requiring additional grass cover. Operations are typically timed to provide the maximum area available for seeding operations.

Seeding operations include preparation of the seedbed, applying fertilizer or lime as necessary, applying seed blend, and applying mulch as necessary.

4.4 Erosion Control Measures

Because exposed earth fill is subject to erosion, temporary and permanent erosion control measures are used to mitigate the potential for severe erosion and are part of the active maintenance program at the Landfill. In addition to seeding, other erosion control measures include the following:

- Stormwater letdowns;
- Rock-lined ditches and swales; and
- Grass-lined ditches and swales.

Temporary erosion control measures are used as necessary to reduce erosion of exposed slopes on waste disposal areas, berms, or stockpiles. Temporary erosion control measures include the following (use will depend on the time of year and the length of time it is anticipated that the soil will remain exposed):

1. Seeding;
2. Tracking slopes perpendicular to the fall line;
3. Covering with mulch;

4. Grass mats; and
5. Diversion ditches and stormwater letdowns.

Tracking of slopes (bulldozer tracks made perpendicular to the fall line of the slope) is completed as soon as the slope is finished, regardless of the time of year. Mulching of exposed slopes is done during wet weather conditions when seeding is not possible. Diversion ditches and slope drains will be constructed as necessary to prevent surface water flow from eroding exposed and covered slopes as well as preventing runoff generated on surrounding land from running into the active areas of the Landfill.

4.5 Sedimentation Control

The erosion control measures described in Section 4.3 will mitigate offsite sedimentation by reducing the amount of soil carried away in the runoff. Additional sedimentation controls include sediment barriers and the facility sedimentation pond.

4.5.1 Sediment Barriers

Sediment barriers include hay bales and silt fencing. They require no engineering design and are placed as needed during operations. They are most frequently placed below disturbed slopes to prevent silt in overland flow from reaching channels or ditches. The barriers will be installed per the Permit Drawings.

Sediment control fences will also be constructed and maintained in the drainage channels of the active areas of the site. Sediment shall be removed to keep channels open and the soil replaced at the source as required.

Figures 3.4 and 3.5 identify typical sediment barriers.

4.5.2 Sedimentation Pond

The facility has a sedimentation pond (3.2 acres) that collects any sediments from the Landfill prior to release of the stormwater to the city's sanitary sewer system. The pond is occasionally dredged to remove the collected sediment, which is drained and then used as cover soil material.

4.6 System Maintenance Procedures

It is very important that the stormwater management system at the site is maintained so that it may function properly during a storm event. The following maintenance is recommended especially after large storm events.

1. Keep all ditches and swales unobstructed;
2. Remove sediment from ditches, swales, sediment basins, and sediment barriers routinely. Sediment controls are most effective when sediment is removed regularly;
3. Inspect and clean check dams and outlet control structures of sediment and other materials that may restrict flow;
4. Periodically inspect the stormwater system for damage and repair immediately; and
5. Inspect and clean the stormwater system following a major storm event.

Additional inspection and maintenance requirements and procedures are included in Section 7.0 of this document.

5.0 GROUNDWATER AND EXPLOSIVE GAS MONITORING

The Sampling and Analysis Plan (Appendix I of the Permit Modification Application, May 2008) provides an explanation of the groundwater monitoring system and the sampling and analysis procedures. The Sampling and Analysis Plan provides a description of the hydrogeology of the landfill area, the rationale for the placement of the monitoring wells, the groundwater sampling procedures, the analytical and statistical analysis procedures, and the reporting procedures. A copy of the Sampling and Analysis Plan is located in the facility POR.

The Landfill is required to conduct monitoring on a quarterly basis for explosive gases at designated sampling probes and structures. Details of the explosive gas monitoring and reporting for the facility is described in the Gas Monitoring Plan (Appendix G of the Permit Modification Application, May 2008). A copy of the Gas Monitoring Plan is located in the facility POR.

6.0 LEACHATE COLLECTION AND TRANSMISSION

In accordance with Regulation No. 22, the Landfill has been designed to include a leachate collection and transmission system. This section provides a description of the collection, transmission, and disposal of leachate from the Landfill.

6.1 Leachate Collection System

The leachate collection system for Cells 1 through 3 were constructed with a leachate drainage layer and a perforated drainage collection pipe on the bottom of each cell. The drainage layer consisted of 12 inches of sand and the pipe was a perforated 6-inch diameter HDPE pipe in a bed of gravel. The collected leachate from these three disposal cells is conveyed by gravity flow out of the Landfill.

For Cells 4 (already constructed) through 6, the collection system includes a 12-inch thick drainage layer, a 6-inch diameter HDPE perforated drainage pipe in a bed of washed gravel, and a collection sump. The sump is located in the northern end of each cell and is a depressed area of approximately 50 ft by 50 ft and 2-ft deep. The sump is filled with washed gravel and surrounded by a geotextile fabric. A side-slope riser pipe and pump are used to evacuate the leachate from the sump.

The system was designed to have a maximum leachate head level of less than 12 inches at any point on the bottom liner system. The system will be installed in Cells 5 and 6 as shown on the Permit Drawings and in accordance with the construction documents.

6.2 Leachate Transmission System

Leachate from Cells 1 through 3 is conveyed via a gravity piping system located north of each disposal area. The leachate flows via a 6-inch diameter polyvinyl chloride (PVC) pipe into a manhole located north of the northern access road. The leachate is then conveyed to an underground storage tank located northwest of the Landfill. The city periodically empties the tank directly into the city's sanitary sewer system.

The leachate transmission system for Cells 4 (already installed) through 6 includes a dual-contained HDPE pipeline that discharges into the manhole north of Cell 3. Each pumping system from Cells 4, 5, and 6 directly discharges into the dual-contained piping.

The system will be installed in Cells 5 and 6 as shown on the Permit Drawings and in accordance with the construction documents.

6.3 Leachate Disposal

Leachate collected from the Landfill is conveyed to an underground storage tank located north of the northwestern corner of the Landfill. When the tank is full, city employees discharge the collected leachate into the city's sanitary sewer system.

6.4 Leachate Sampling

Leachate will be sampled on a semi-annual basis for the parameters listed in Table 6.1. If the facility is placed in assessment groundwater monitoring at any time in the future, the parameter list for leachate sampling will be expanded to include Regulation No. 22, Appendix 2 parameters, and sampling will occur at the same frequency as groundwater monitoring.

Table 6.1. Leachate sampling parameters.

Organic Parameters	Inorganic Parameters
Acetone	Antimony
Acrylonitrile	Arsenic
Benzene	Barium
Bromochloromethane	Beryllium
Bromodichloromethane	Cadmium
Bromoform	Chromium
Carbon Disulfide	Cobalt
Carbon Tetrachloride	Copper
Chlorobenzene	Lead
Chloroethane	Nickel
Chloroform	Selenium
Dibromochloromethane	Silver
DBCP	Thallium
EDB	Vanadium
1,2-Dichlorobenzene	Zinc
1,4-Dichlorobenzene	Chloride
trans-1,4-Dichloro-2-Butene	Total Dissolved Solids
1,1-Dichloroethane	Sulfate
1,2 Dichloroethane	Total Organic Carbon
1,1 Dichloroethylene	Iron
cis-1,2-Dichloroethylene	Manganese
trans-1,2-Dichloroethylene	pH*
1,2-Dichloropropane	Conductance*
cis-1,3-Dichloropropene	Turbidity*
trans-1,3-Dichloropropene	Temperature*
Ethylbenzene	
2-Hexanone	
Methyl Bromide	
Methyl Chloride	
Methylene Bromide	
Methylene Chloride	
Methyl Ethyl Ketone	
Methyl Iodide	
4-Methyl-2-Pentanone	
Styrene	
1,1,1,2-Tetrachloroethane	
1,1,2,2-Tetrachloroethane	
Tetrachloroethylene	
Toluene	
1,1,1-Trichloroethane	
1,1,2-Trichloroethane	
Trichloroethylene	
Trichlorofluormethane	
1,2,3-Trichloropropane	
Vinyl Acetate	
Vinyl Chloride	
Xylene	

*Field Parameter

7.0 INSPECTION AND MAINTENANCE

Inspections and maintenance of the Landfill are performed routinely. Records of inspections conducted by city of Morrilton personnel, and of any actions taken are kept on the Operations Inspection Form included in Attachment 1 of this document. An inspection and maintenance schedule is included in Table 7.1 of this section. Inspection records are placed in the POR and are available for review.

Table 7.1. Inspection and routine maintenance schedule checklist.

Item	Minimum Frequency
Stormwater Facilities	Monthly
Leachate Pumping System	Monthly
Final Cover System	Monthly
Facility Roads	Monthly
Emergency Response Equipment	Monthly
Waste Cell Markers	Monthly
Survey Control Monuments	Annually
Gas Monitoring Probes	Quarterly
Groundwater Monitoring Wells	Semi-Annually

7.1 Stormwater Facilities

Stormwater facilities such as ditches, letdowns, and culverts shall be inspected monthly, and cleaned or repaired as necessary.

7.2 Leachate Pumping System

The leachate pumping system will be inspected monthly to ensure proper operation and quantification of leachate generated.

7.3 Final Cover System

The landfill final cover system shall be inspected monthly for evidence of erosion, cracking or surface depressions. Where severe erosion has taken place, soil cover is reapplied and seeded, given the appropriate seeding conditions. Temporary or permanent erosion control

measures will be used if significant erosion occurs. The various types of erosion control methods are discussed in Section 4.4 of this document. Areas of leachate seepage will be promptly repaired.

7.4 Facility Roads

Temporary and permanent access roads shall be maintained regularly to provide easy access, and to control dust and mud accumulations. The facility roads shall be graded and additional material will be applied periodically to keep rutting, washboarding, mud, and dust accumulation to a minimum.

7.5 Emergency Response Equipment

Check communication equipment, list of emergency phone numbers and first aid kits monthly and replace items as necessary. Test fire extinguishers annually and check condition once a quarter.

7.6 Waste Cell Markers and Landfill Grid Markers

Inspect waste cell markers and landfill grid markers monthly and repair or replace as necessary.

7.7 Survey Control Monuments

The survey control markers will be inspected annually as part of the annual engineering inspection. Markers will be reestablished immediately if damaged.

7.8 Gas Monitoring Probes

The gas monitoring probes will be inspected quarterly during monitoring activities. The probes will be inspected for damage. Any defects will be repaired as soon as practical.

7.9 Groundwater Monitoring Wells

The groundwater monitoring wells will be inspected semi-annually during sampling operations. The well casing, the concrete pad and the pipe bollards will be inspected for damage. The wells will be inspected for any obstruction. Any defects or obstructions to the wells will be repaired as soon as practical.

7.10 Equipment

City of Morrilton personnel will provide routine operational maintenance of the equipment used at the Landfill.

8.0 HEALTH AND SAFETY

8.1 Introduction

The primary purpose of this section is to help prevent personal injuries or illnesses that may be caused by conditions typically found at solid waste landfills. It is not the intent of this section to establish a comprehensive safety program for landfill operators; rather to generally present the special hazards related to landfills.

8.1.1 General

The landfill facility should be maintained in such a manner as to continually provide a safe place to work. This can be done only by constantly thinking safety. Analyze jobs, work areas, and procedures from a safety standpoint, and learn to recognize potentially hazardous actions or conditions. When a hazard has been recognized, immediate steps should be taken to eliminate it by corrective action. If corrective action is not possible, guard against the hazard by proper use of warning signs and devices, and by the establishment and maintenance of safety procedures.

The safety hazards associated with landfill operations are many and varied. Accidents may be prevented by using good common sense, applying a few basic rules, and particularly by becoming knowledgeable of the hazards peculiar to a job.

8.1.2 Reporting and Investigation of Accidents and Illnesses

Accidents must be reported promptly to the employee's immediate supervisor for evaluation and/or investigation. Immediate reporting is mandatory, not only to comply with applicable laws and regulations, but also to ensure that steps are taken to correct the conditions that contributed to the accident. Because every accident includes a sequence of contributing factors, it is possible to avoid a repeat of the first event by recognizing and eliminating these factors. The removal of just a single factor could prevent a recurrence. Refer to the Emergency Response Plan (Attachment 2) for reporting procedures.

8.2 Potential Hazards

Solid waste personnel work in all types of weather, with many different types of heavy equipment, and with a variety of materials presenting diverse hazards. For this reason, safety equipment must be used and maintained in a sanitary and reliable condition. Personal protective equipment (for eyes, face, head, hearing, and extremities), protective clothing, respiratory devices, and other protective equipment must be worn whenever hazards of processes or environment are capable of causing injury.

First-aid kits are located at the Scale House and in the Baling Building. Safety showers, eye washes, and fire-retardant blankets are accessible to landfill operators for use in the event of exposure to injurious materials.

8.3 Hazard Abatement Procedures

The following procedures, guidelines, and recommendations represent standards in the landfill industry presently in use to mitigate or eliminate the various safety and health hazards that may exist at the Landfill.

8.3.1 Traffic Control

To prevent unnecessary traffic in and around the working face, customers will be directed to dump waste only in designated areas.

8.3.2 Scavenging and Salvaging

Scavenging at the Landfill will not be permitted. No salvage operations are conducted at the working face.

8.3.3 Personal Protective Equipment

Refer to the Emergency Response Plan (Attachment 2) for requirements on personal protective equipment.

8.3.3.1 Operations Safety

Transporting and unloading solid waste is a serious area of safety concern. Uncontrolled dust, differing flows and direction of traffic and operational equipment, and equipment operation angles pose dangers to those in the vicinity of the working face. For these reasons, safeguards will be provided on landfill equipment to protect the operator and the vehicle. Landfill operating personnel who direct the delivery vehicles must take care to maintain sufficient clearance between the vehicle and the landfill equipment. Normal safety precautions will be exercised while operating or working in the vicinity of heavy equipment.

8.3.4 Fire Prevention and Control

In the event that a fire occurs, landfill operators shall attempt to control it as soon as possible by:

- Covering it with soil;
- Removing and covering it with soil; or
- Using a fire extinguisher.

Portable fire extinguishers are kept in all onsite buildings. Personnel will be trained in the use of these extinguishers and should become familiar with their locations. The extinguishers will be tested annually and checked quarterly and maintained in a ready condition.

In the event that a fire cannot be controlled by onsite means, the local fire department will be contacted to respond.

8.4 Emergency Procedures

The emergency conditions discussed in this section are general. It is not intended to cover every possible emergency situation. The site personnel must be constantly aware that problems may arise. In addition, the list of important phone numbers are kept at the Scale House and are updated as necessary. The procedures for an emergency are outlined in the Emergency Response Plan (Attachment 2). Table 8.1 provides a list of emergency telephone numbers for landfill employees.

9.0 RECORDKEEPING AND REPORTING

9.1 Landfill Permanent Operating Record

The city maintains most of the POR for the Landfill at the city administrative offices in Morrilton. However, some records are kept at the Landfill's Scale House. The POR contains all records required by this regulation or permit conditions. All information contained in the facility operating record is available for inspection and is provided to ADEQ upon request. The city of Morrilton will maintain these records until the Director of ADEQ authorizes the destruction of the records following the completion of the post-closure monitoring period.

The POR includes the following information:

1. Permit information, regulations, and operator licenses;
2. Location restriction demonstrations;
3. Groundwater monitoring and leachate collection documentation;
4. Asbestos disposal records;
5. Operational plans and programs;
6. Inspection records, training procedures and records, and notification procedures;
7. Design demonstrations;
8. Geotechnical and hydrogeological information;
9. Closure and post-closure plans and any associated testing data related to the plans; and
10. Financial assurance documentation.

Notifications of the above entries have been or will be submitted to the Solid Waste Management Division (SWMD) of ADEQ as required by this section of the regulation. In addition, when documents pertaining to the above items have been placed, replaced or added to the POR, the SWMD will be notified in writing.

Table 8.1. Emergency telephone numbers.

Emergency	Contact Name or Agency	Contact Number
Fire, Hazardous Waste/Unauthorized Waste Spill or Disposal, Accident/Injuries	911	911
	Morrilton Fire Department	(501) 354-3511
	ADEQ Solid Waste Management Division	(501) 682-0600
	Mayor's Office	(501) 354-1556
	ADEQ Field Inspector	(479) 968-7339
Spills into Surface Water	Mayor's Office	(501) 354-1556
	ADEQ Field Inspector	(479) 968-7339
	ADEQ Water Division	501-682-0654

8.5 Handling of Unacceptable Wastes

Only authorized wastes are allowed for disposal at the Landfill. These wastes include nonhazardous household, commercial, and industrial solid waste, as defined in Regulation No. 22, and small quantities of conditionally exempt hazardous wastes. The Landfill's Hazardous and Unauthorized Waste Exclusion Plan outlines the procedures for handling unauthorized wastes.

9.2 Inspection Log

9.2.1 Inspection by City of Morrilton Personnel

Inspections of the overall site, facilities, and operations are carried out on a routine basis. Inspections are performed often enough to identify problems in time to correct them before they harm human health or the environment. Inspections also prevent malfunction, deterioration, and operator error from affecting the performance of the facilities and operations.

The frequency of inspections is noted on the inspection checklist (an example checklist is located in Attachment 1 of this document). Inspections are also carried out after any major storm event or natural disaster. Inspection of the items on the checklist is recorded on the maintenance log. The inspection checklist and maintenance log will be kept in the POR. The inspection checklist and maintenance log will be made available to the SWMD of ADEQ on request.

9.3 Reports

9.3.1 Waste Quantity Reports

The facility prepares and submits the required waste quantity reports on a quarterly basis. The reports include the weight and class of solid waste that has been disposed at the Landfill during the previous 3 months.

9.3.2 Monitoring Results

Records of monitoring activities and results are submitted to ADEQ, as required, and will be maintained in the facility POR until destruction of the records is authorized by the Director of ADEQ following completion of the post-closure monitoring period.

9.3.3 Annual Engineering Report

An annual report will be prepared by an Arkansas-registered Professional Engineer and submitted to the SWMD of ADEQ by March 31 of each year. This document will include the following:

1. The volume remaining in the current landfill cell or area and the projected date for opening new cells or areas;

2. The estimated remaining volumetric capacity of all permitted Class 1 units the landfill capacity used during the past 1-year reporting period, and the estimated remaining site life considering the current waste stream;
3. Documentation of compliance of facility fill progression with the approved permit plans and specifications, and this Operating Plan;
4. Documentation of operational compliance with the requirements of Regulation No. 22, facility permit conditions, permit plans and specifications, and this Operating Plan;
5. An updated contour map that depicts:
    a. The horizontal and vertical extent of the active and inactive fill areas;
    b. The status of each permitted landfill unit or cell (future unit, active unit, inactive, under construction, under interim cover, undergoing closure, closed, post-closure, etc.);
    c. The survey grid system required by §22.426;
    d. The location of any other visible surface features or improvements such as roads, fences, buildings, gas control systems, surface water control systems, etcetera; and
    e. The person responsible for gathering survey data and the date(s) that survey data was taken to prepare the map.
6. Quantity, location, and characteristics of leachate collected, recirculated, and disposed;
7. Maintenance of stormwater controls and other best management practices for erosion control;
8. Status of capping and closure of completed areas;
9. Status of remedial or corrective actions taken;
10. Updated Financial Assurance documentation;
11. Revised or updated facility Closure Plan, as necessary; and
12. Any other items that affect compliance at the Landfill.

9.4 Incident Reports

9.4.1 Emergency Reports

The city of Morrilton will submit a written report to the SWMD of ADEQ within 48 hours after an emergency has occurred at the landfill facility. The report will describe the emergency and the actions taken to minimize hazards to human health and the environment. The

report will also outline any follow up procedures that will be implemented. Emergencies include fires, explosions, storm damage, and any other events requiring the prompt intervention of city of Morrilton personnel, police, fire department, or other public health and safety officials.

9.4.2 Notifying Government Agencies

In the event that the city of Morrilton does not, or is unable to, comply with any of the conditions specified in the facility's operating permit, the city will do the following:

- Provide the SWMD of ADEQ with a description of the nature and cause of noncompliance;
- Inform the SWMD of ADEQ of the period of noncompliance, including exact dates and times and/or the anticipated time when the facility will return to compliance;
- Notify the SWMD of ADEQ of steps taken or to be taken to reduce, eliminate, and prevent recurrences of the noncompliance; and
- Take the first three actions listed above within 24 hours in the case of any noncompliance that could constitute a threat to human health, welfare or the environment, and, if the requisite information is provided orally, provide it in writing within 5 days, unless this requirement is waived or extended by the SWMD of ADEQ on a case-by-case basis.

The SWMD of ADEQ will be notified:

- Whenever there has been or there is an anticipated violation of the conditions in the operating permit;
- Whenever there has been or there is an anticipated material change in the quantity of waste disposed at the facility; and
- Whenever there has been or there is an anticipated material change in the type of waste disposed at the facility.

10.0 CLOSURE PLAN

The Landfill's Closure and Post-Closure Care Plan (Appendix J of the Permit Modification Application, May 2008) provides an explanation of the procedures for closure activities. The Closure and Post-Closure Care Plan identifies the closure requirements, the procedures for installation of the final cover system, the facility closure schedule, and the documentation requirements for the closure activities.

A copy of the Closure and Post-Closure Care Plan is located in the facility POR.

11.0 POST-CLOSURE CARE PLAN

The Landfill's Closure and Post-Closure Care Plan (Appendix J of the Permit Modification Application, May 2008) provides an explanation of the procedures for post-closure care activities to be performed at the facility. The Closure and Post-Closure Care Plan identifies the post-closure care monitoring and maintenance requirements, the contact individuals during the post-closure care period, estimates for post-closure care costs, proposed uses of the site and certification procedures for the post-closure activities.

A copy of the Closure and Post-Closure Care Plan is located in the facility POR.

ATTACHMENT 1

Forms

ASBESTOS DISPOSAL LOG FORM

Date of Disposal:_____ Transporting Firm_____

Characteristics of the Material:_____Friable _____Non-friable

Percentage Estimate of Friable Versus Non-friable Material:_____

Generator of Asbestos Material_____

_____

Source of the Asbestos Material:_____

Estimated Quantity of Asbestos This Load (cubic yards)_____

Specific Area of Landfill for Ultimate Disposal (Cell No. & Coordinates):_____

_____

Discrepancies or Concerns Requiring Correction Before Disposal:_____

_____

_____

Landfill Representative Completing Log:_____

Date of Authorization:_____

ASBESTOS DISPOSAL REQUEST
TELEPHONE LOG

Date:_____

Landfill Representative Taking Request:_____

Name of Generator:_____

Source of Asbestos:_____

Condition of Asbestos: _____Friable _____Non-friable

Estimated Volume of Asbestos (cubic yards)_____

Analytical Results: _____Available _____Not Available

Hauler Responsible for Transport:_____

Date Requesting Disposal:_____

ASBESTOS WASTE SHIPMENT RECORD

GENERATOR

1) Owner's name: _____

2) Owner's telephone/fax number: _____

3) Operator/Contractor name and address _____

4) Operator/Contractor telephone number: _____

5) Waste disposal site name and mailing address: City of Morrilton Class I Landfill

210 North Moose Street Morrilton, Arkansas 72110

6) Waste disposal site telephone number: (501) 354-1556

7) Name/Address responsible regulatory agency: Arkansas Department of Environmental Quality

8) Friable or non-friable asbestos material: _____

9) Percentage estimate of friable versus non-friable: _____

10) Containers: Number _____ Type _____

11) Total Quantity: _____

12) Special handling instructions and additional information: _____

_____

_____

13) Generator Certification

I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, marked and labeled, and are in all respects in proper condition or transport by highway according to applicable international and government regulations.

_____

Print/Type Name & Title Shipment Date

TRANSPORTER

1) Name of Company: _____

2) Address: _____

3) Driver: _____

Acknowledgement of receipt of asbestos material: _____

Signature Date

CITY OF MORRILTON CLASS 1 LANDFILL
Operations Inspection Form

DESCRIPTION	INSPECTION INTERVAL	PASS	FAIL**
Surface Water System			
Drainage Ditches & Culverts	Monthly		
Berms	Monthly		
Leachate Collection System			
Pumps	Monthly		
Totalizer	Monthly		
Landfill Final Cover System			
Erosion	Monthly		
Ponded Water	Monthly		
Settlement	Monthly		
Vegetation	Monthly		
Facility Roads			
Safety	Monthly		
Routing	Monthly		
Condition	Monthly		
Mud	Monthly		
Passable Width	Monthly		
Emergency Response Equipment			
Fire Extinguisher	Test annually, check quarterly		
Communication System	Monthly		
List of Emergency Phone Numbers	Monthly		
First Aid Kits	Monthly		
Waste Cell and Grid Markers	Monthly		
Survey Markers	Annually		
Explosive Gas Monitoring Probes	Quarterly		
Groundwater Monitoring Wells	Semi-Annually		

** Explain failure on back of form.

ATTACHMENT 2

Emergency Response Plan

EMERGENCY RESPONSE PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

MAY 1, 2008

EMERGENCY RESPONSE PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

Prepared for

City of Morrilton
210 North Moose Street
Morrilton, AR 72110

Prepared by

FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, AR 72211

FTN No. 4490-100

May 1, 2008

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1.0 INTRODUCTION

This Emergency Response Plan provides emergency response procedures associated with the development and daily operation of the City of Morrilton Class 1 Landfill (the Landfill). This document is intended to fulfill the requirements of Arkansas Pollution Control and Ecology Commission (APCEC) Regulation No. 22, §22.411(k) and §22.607(k). This document has been prepared to provide a written reference and directive for landfill personnel in case of an emergency.

This document is divided into six sections. A brief description of these sections is provided below.

1. Section 1.0 – Introduction: provides general information regarding this document.
2. Section 2.0 - General Information: provides information specific to the City of Morrilton Class 1 Landfill.
3. Section 3.0 – Emergency Response: provides locations of emergency equipment, emergency procedures, personnel training, and emergency telephone numbers.
4. Section 4.0 – Access Control and Security: describes the access and security measures in place at the Landfill.
5. Section 5.0 – Recordkeeping and Reporting: provides and explanation of the facility permanent operating record (POR) system and reporting procedures.
6. Section 6.0 – Plan Review and Amendments: explains the periodic evaluation of emergency response procedures.

2.0 GENERAL INFORMATION

2.1 Facility Description and Design

The city of Morrilton solid waste management facility (Class 1 landfill) is located about 2 miles southeast of Morrilton in Conway County, Arkansas (Figure 1). The city of Morrilton proposes to vertically expand the Landfill on the existing permitted footprint (no lateral expansion). The existing landfill encompasses approximately 80 acres, of which approximately 30 acres is used for Class 1 waste disposal.

2.2 General Topography and Drainage

The site topography consists of about 50 acres of upland terrain and about 20 to 30 acres of low-lying flatland. Elevations at the site range from a low elevation of 287 ft National Geodetic Vertical Datum (NGVD) of 1929 to a high point elevation of 328 ft NGVD.

Collected surface waters from the Landfill will be diverted to perimeter drainage ditches that drain to onsite sedimentation ponds. All stormwater from the ponds is discharged to the city's sanitary sewer system.

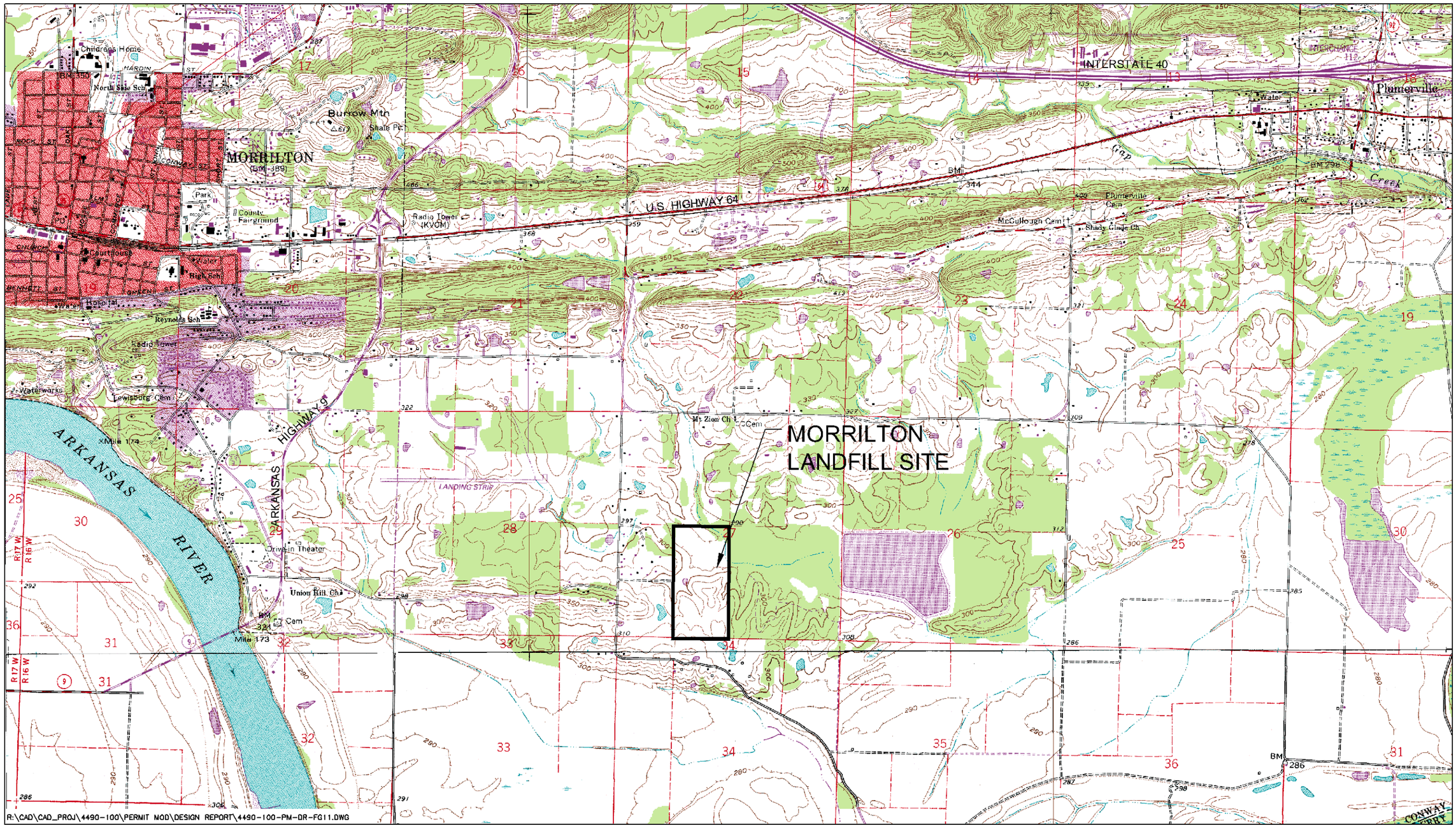


Figure 1. Site location map.

3.0 EMERGENCY RESPONSE

3.1 Emergency Equipment

Telephones are available at the Scale House that is located at the entrance to the Landfill. During normal operating hours, at least one city of Morrilton employee is available in the Scale House to manage communications. Supervisory personnel at the Landfill are equipped with two-way radios and cellular telephones that can be used in the event of an emergency situation. Dry chemical extinguishers are mounted in each of the city's onsite buildings. The following equipment is available at the Scale House or office/baling building for use in an emergency situation:

1. Face, eye, and ear protection;
2. Rubber boots and hard hats;
3. First aid kits;
4. Shovels;
5. Absorbent material;
6. Eye wash/emergency shower; and
7. Fire extinguisher.

3.2 Emergency Procedures

Emergency situations include, but are not limited to, fire, accidents/injuries, unauthorized waste spills or disposal, security breeches, or natural disasters. In the event of an emergency, the Landfill Supervisor is the designated onsite coordinator. If the Landfill Supervisor is absent or is unable to fulfill this function, an alternate will be designated. The person discovering the emergency condition will immediately contact the Landfill Supervisor or an alternate. If the situation is determined to threaten human health or the environment, all personnel at the facility, including city of Morrilton employees, contractors, and haulers, will be notified of the situation. The Landfill Supervisor will then call/notify the appropriate response personnel or agency or he will direct another landfill employee to make the necessary calls. Depending on the type and severity of the emergency, the site may be evacuated. The main landfill entrance will serve as the primary evacuation route. The entrance is located near the northwest corner of the landfill property. If time permits, all equipment and utilities should be shut down and fireproof file

drawers should be locked. Following evacuation, all personnel should congregate at the landfill entrance gate (unless the onsite coordinator directs otherwise). All personnel should then be accounted for.

If there is a chemical release, fire, or explosion the onsite coordinator will implement actions to identify the character, source, quantity, and extent of released materials. The reconnaissance will be conducted only if it can be done without compromising the safety of the facility personnel.

The onsite coordinator will arrange for cleanup or disposal of any recovered waste, contaminated soil or water, or other material that results from a release, fire, or explosion. The onsite coordinator will ensure that all emergency equipment has been cleaned and returned to its designated location before operations resume. Following the emergency and any recommendations for changes to operating or emergency procedures. A copy of the report will be placed in the facility's POR.

3.2.1 Accident/Injury

In the event of an accident or injury, the onsite coordinator will determine the severity of the injury. Landfill personnel should stop any bleeding, if possible, and administer first aid. For minor injuries requiring further medical attention, landfill personnel may transport the victim to the hospital. St. Anthony's Medical Center is located approximately 6 miles from the site at 4 Hospital Drive in Morrilton, Arkansas. A map of the route to the hospital is shown on Figure 2. If the injury is severe, the victim should not be moved and 911 will be called to dispatch assistance. Assistance should be provided only at the emergency team's instruction. After the emergency team has left, the onsite coordinator will document the accident.

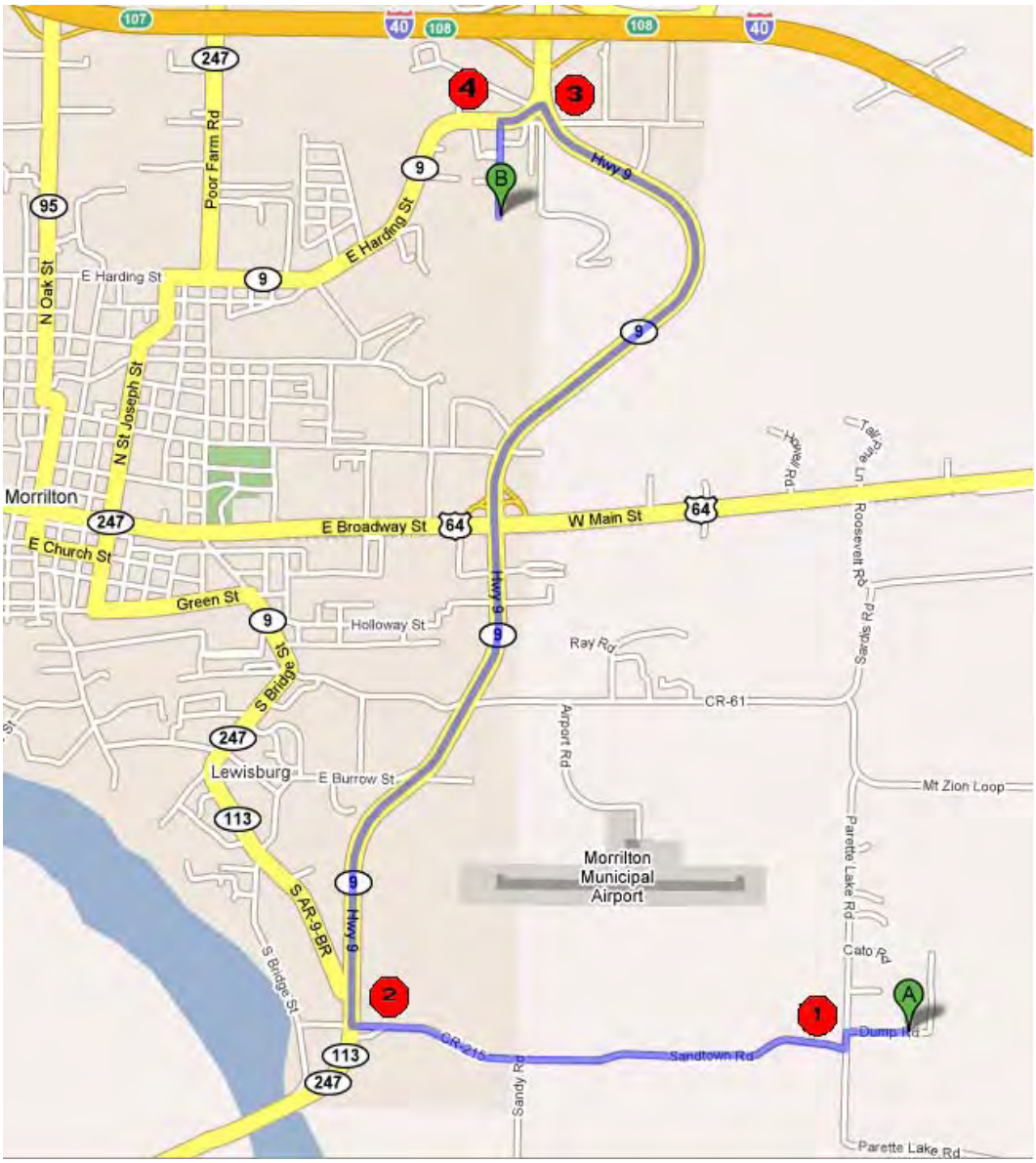


Figure 2. Route to hospital.

Directions from (A) Dump Road, Morrilton, AR 72110 to
(B) St. Anthony's Medical Center, 4 Hospital Drive, Morrilton, AR 72110

1. Turn left onto Parette Lake Road and then immediately turn right onto CR-215/Sandtown Road;
2. Turn right onto SR-9/SR-113/SR-247;
3. Turn left onto SR-9 Bus/N AR-9-Br; and
4. Turn left onto Hospital Drive.

3.2.2 Earthquake

Ground movement is seldom the direct cause of death or injury in an earthquake. Most earthquake-related casualties result from collapsing walls, flying glass, and falling objects. If indoors at the time of an earthquake, personnel should:

1. Stay indoors and take cover under a sturdy table or other piece of furniture;
2. Hold on until the shaking stops;
3. Stay away from glass, windows, outside doors, and walls, and anything that could fall; and
4. Use a doorway for shelter only if it is in close proximity and if it is known to be a strongly supported, load-bearing doorway.

If outdoors at the time of an earthquake, personnel should:

- Stay outside;
- Move away from buildings, power poles, and utility wires; and
- Once in the open, stay there until the shaking stops.

If in moving equipment or a vehicle, personnel should:

- Stop as quickly as safety permits and stay inside the vehicle (avoid standing near or under buildings, trees, overpasses, and utility wires) and
- Proceed cautiously once the earthquake has stopped (avoid roads, bridges, or ramps that may have been damaged).

If trapped under debris, personnel should:

- Cover their mouth with a handkerchief or clothing;
- Tap on a pipe or wall to be located by rescuers (shout only as a last resort to avoid inhaling dangerous amounts of dust); and
- **Personnel should not** light a match, move about, or kick up dust.

3.2.3 Explosions and Fire

The person discovering a fire or explosion should contact the onsite coordinator and try to extinguish the fire with extinguishers or stockpiled soil. If it appears that the fire cannot be contained with onsite equipment and personnel, the local fire department should be called immediately. If danger to personnel is evident or there is the potential for explosion, initiate evacuation of the area or facility.

If the waste inside a hauling truck catches fire, the driver should be instructed to drive the truck to a location away from the working face and as close to soil stockpiles as possible. If possible, the driver should park the truck facing into the wind and the truck should be unloaded as quickly as possible. Landfill operators should cover the burning waste with soil using dozers if possible. Water may be used to help extinguish the fire.

3.2.4 Storms and Tornadoes

Thunderstorms are most likely to develop on spring or summer days but can occur year round. Lightning can strike as far as 10 miles from the area where it is raining. If thunder can be heard, lightning is within striking distance and safe shelter should be obtained, such as an enclosed building or enclosed vehicle. Equipment operators should shut down the equipment, close the doors, and sit with hands in lap, waiting out the storm. Once inside a building, stay there until 30 minutes after thunder was last heard. Electronic devices and plumbing fixtures should not be used in a storm. If shelter is sought in a vehicle, all doors should be closed and windows should be rolled up. Metal surfaces should be not be touched.

In case of a tornado watch, landfill personnel and contractors should be notified of the potential threat. If a tornado warning is issued, landfill personnel and contractors will be notified and conditions will be monitored. If a tornado is believed to be in the vicinity of the Landfill, personnel should take cover in the interior of a sturdy permanent building within easy running distance if possible, under some kind of sturdy protection (heavy table or desk), away from glass, and covering their heads. Shelter should not be sought in a mobile home-type structure because most tornadoes can destroy even tied-down mobile homes. If a sturdy permanent building is not

within easy running distance, personnel should lie flat, face-down on low ground away from structures, trees, and cars and protect the back of their head with their arms.

After a tornado has passed, personnel should stay away from power lines and puddles with wires in them, stay out of heavily damaged structures, and not use matches or lighters in case of natural gas leaks.

3.2.5 Hazardous/Unauthorized Waste Spills or Disposal

Waste screening is performed in accordance with the Hazardous and Unauthorized Waste Exclusion Plan that is maintained for the Class 1 facility. In the event that hazardous or unauthorized wastes are discovered at the Landfill, procedures in the Hazardous and Unauthorized Waste Exclusion Plan for the Class 1 landfill should be implemented.

3.3 Personnel Training

Landfill operators are trained in accordance with APCEC Regulation No. 27 certification requirements for Class 1 landfills. Recognition of hazardous wastes is included in the training. Training records are filed in the facility POR.

3.4 Emergency Contacts

Emergency telephone numbers are listed in Table 1.

Table 1. Emergency telephone numbers.

Emergency	Contact Name or Agency	Contact Number
Fire, Hazardous Waste/Unauthorized Waste Spill or Disposal, Accident/Injuries	911	911
	Conway County Fire Department District 12 or Morrilton Fire Department	(501) 477-2138 or (501) 354-3511
	ADEQ Solid Waste Management Division	(501) 682-0600
	Mayor's Office	(501) 354-1556
	ADEQ Field Inspector	(479) 968-7339
Spills into Surface Water	Mayor's Office	(501) 354-1556
	ADEQ Field Inspector	(479) 968-7339
	ADEQ Water Division	(501) 682-0654

4.0 ACCESS CONTROL AND SECURITY

Entrance to the Landfill is secured by locked steel gates when the Landfill is closed. The perimeter of the Landfill is posted to discourage trespassing. Access to the Landfill is controlled and managed by employees of the city of Morrilton. The route to the Landfill is typically via Arkansas Highway 9, then east on County Road 215/Sandtown Road to Parette Lake Road, and then north to Dump Road and east on Dump Road to the Landfill. Disposal vehicles access the Landfill via the main entrance road (Dump Road) to the Landfill that is located on the northwest corner of the facility. Information and/or directional signs are posted to direct traffic to the working face. Landfill operators prohibit any unauthorized access to the landfill area.

5.0 RECORDKEEPING AND REPORTING

Accidents must be reported promptly to the employee's immediate supervisor for evaluation and/or investigation. Immediate reporting is mandatory, not only to comply with applicable laws and regulations, but also to ensure that steps are taken to correct the conditions that contributed to the accident. Because every accident includes a sequence of contributing factors, it is possible to avoid a repeat of the first event by recognizing and eliminating these factors. The removal of just a single factor could prevent a recurrence. Refer to Arkansas Workers' Compensation Commission reporting rule No. 099.08 and applicable Occupational Safety and Health Administration reporting requirements for accident reporting procedures. Copies of accident reports will be placed in the facility's POR.

Following an emergency, the Landfill Supervisor will prepare a report describing the nature and cause of the emergency and any recommendations for changes to operating or emergency procedures. A copy of the report will be placed in the facility's POR.

6.0 PLAN REVIEW AND AMENDMENTS

This Emergency Response Plan will be reviewed periodically to evaluate procedures that are in place. The plan will be reviewed and amended as necessary whenever procedures fail in an emergency situation or if the facility changes its design, layout, or operations in a manner that changes the appropriate emergency procedures.

EXPLOSIVE GAS MONITORING PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

REVISED
JULY 14, 2008

EXPLOSIVE GAS MONITORING PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

Prepared for

City of Morrilton
210 North Moose Street
Morrilton, AR 72110

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REVISED
July 14, 2008

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1.0 INTRODUCTION

The city of Morrilton operates a Class 1 (municipal) Landfill (the Landfill) that is located about 2 miles southeast of Morrilton in Conway County, Arkansas. The Landfill operates under Permit No. 0257-S, which was issued in June 1991. The city of Morrilton proposes to vertically expand the Landfill on the existing permitted footprint (no lateral expansion). The vertical expansion will increase the permitted capacity of the Landfill from about 1,328,600 cubic yards (cy) to about 2,481,000 cy. The existing landfill encompasses approximately 80 acres, of which approximately 30 acres is used for Class 1 waste disposal.

Gas monitoring is conducted quarterly at the site in fulfillment of the facility permit and Arkansas Pollution and Control Ecology Commission (APCEC) Regulation No. 22, §22.415 requirements. Section references herein are to Regulation No. 22 (effective April 2006), and references to the American Society for Testing of Materials (ASTM) standards are to the latest revision thereof.

The purpose of this Gas Monitoring Plan (GMP) is to provide a plan for monitoring the existing landfill and landfill expansion areas as they are developed. This GMP describes the proposed gas monitoring program that will be implemented to ensure that:

- The concentration of methane gas generated by the facility does not exceed 25% of the lower explosive limit (LEL) for methane in facility structures; and
- The concentration of methane gas does not exceed the LEL for methane at the facility property boundary.

Section 2.0 of this document provides a site description for the Landfill including site layout, soils, geology, and hydrogeology. Section 3.0 describes the facility's proposed gas monitoring system, and Section 4.0 describes monitoring procedures and recordkeeping. Notification procedures and actions that will be taken if gas levels exceed allowable limits are included in Section 5.0.

2.0 SITE DESCRIPTION

2.1 Area Description

The Landfill lies within the Arkansas Valley region of the Interior Highlands. The Arkansas River is located approximately 2 miles west-southwest of the Landfill. Local natural topography consists of about 50 acres of upland terrain and about 20 to 30 acres of low-lying, flat land. Elevations at the site range from a low elevation of 287 ft to a high point elevation of 328 ft National Geodetic Vertical Datum (NGVD) of 1929. The landfill is located in the eastern half of the southwest quarter of Section 27, Township 6 North, Range 16 West, as shown on Figure 2.1.

The surrounding area is primarily wooded, pasture, or rural residential. There are approximately 45 residential structures located within 0.25 mile of the facility boundary. Of these structures, all but eight are located north of Dump Road (northwest of the waste mass), with the remainder located south of the facility, approximately 0.12 mile from the waste mass. The majority of the residences appear to be mobile home units. Three structures are located onsite: a scale house, a baling/offices building, and an equipment maintenance shop. The scale house is a mobile home unit, and the baling/offices building and equipment maintenance shop are metal-framed buildings.

2.2 Site Layout

The original design of the Landfill included the development of six waste cells or “zones” ranging in size from about 5 to 7 acres. The waste cell disposal layout is shown on Figure 2.2. Cell 1 was constructed prior to the promulgation of Subtitle D regulations and was not constructed with a composite liner system. Cells 2 through 4 were constructed with composite liner systems. All currently prepared cells (Cells 1 through 4) have leachate collection and removal systems. Currently, there are no areas that have received final cover. As of December 2007 and based on historical disposal rates, the estimated site life for the prepared disposal areas (Cells 1 through 4) in the Class 1 landfill is about 28 months.

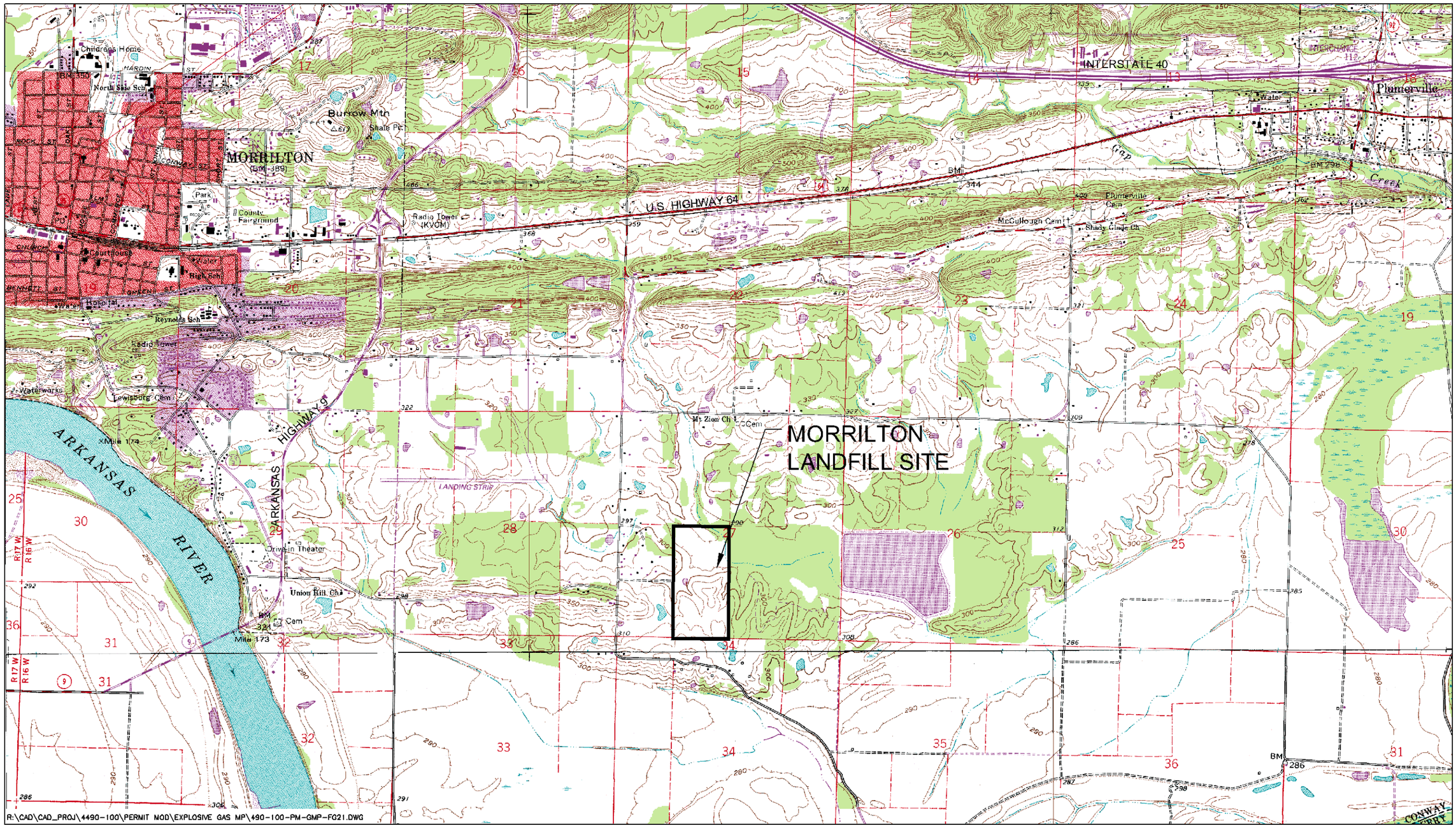


Figure 2.1. Site location map.

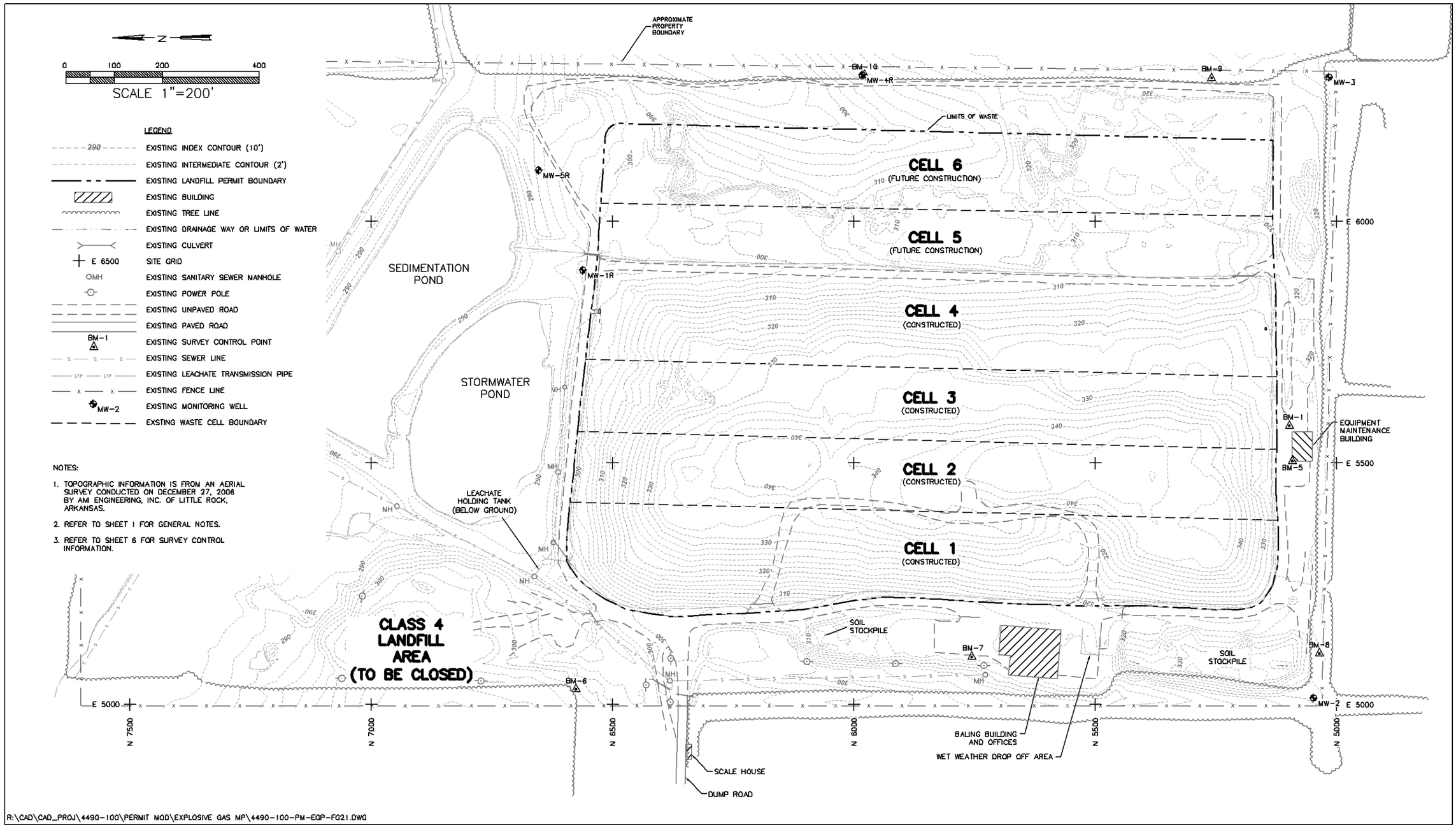


Figure 2.2. Disposal cells layout.

The facility is currently configured with the Scale House and office structure located near the northwest corner of the property. The office/baler building is located along the perimeter road, south of the Scale House, and a maintenance building is located on the south side of the facility.

2.3 Soils

The United States Department of Agriculture (USDA) Soil Conservation Service soil survey for Conway County identifies soils in the vicinity of the landfill site primarily as Muskogee silt loam and Linker fine sandy loam belonging to hydrologic soil groups B and C (USDA 1980), as shown on Figure 2.3.

The Muskogee silt loam generally consists of a brown to yellowish brown silt loam (ML, CL, CL-ML) to depths of about 23 inches, a mottled silty clay loam (CL, CH) to depths of about 34 inches, and a mottled silty clay to mottled clay (CH) to depths of 81 inches or more.

The Linker fine sandy loam is typically a brown fine sandy loam at the surface (SM, ML, SM-SC, CL-ML), with red sandy clay loam to clay loam to depths of about 28 inches (CL, SC, SM, ML), and red, mottled gravelly sandy clay loam (CL, SC, GC, ML) to depths of about 38 inches. USDA reports that a hard sandstone bedrock underlies the Linker soils.

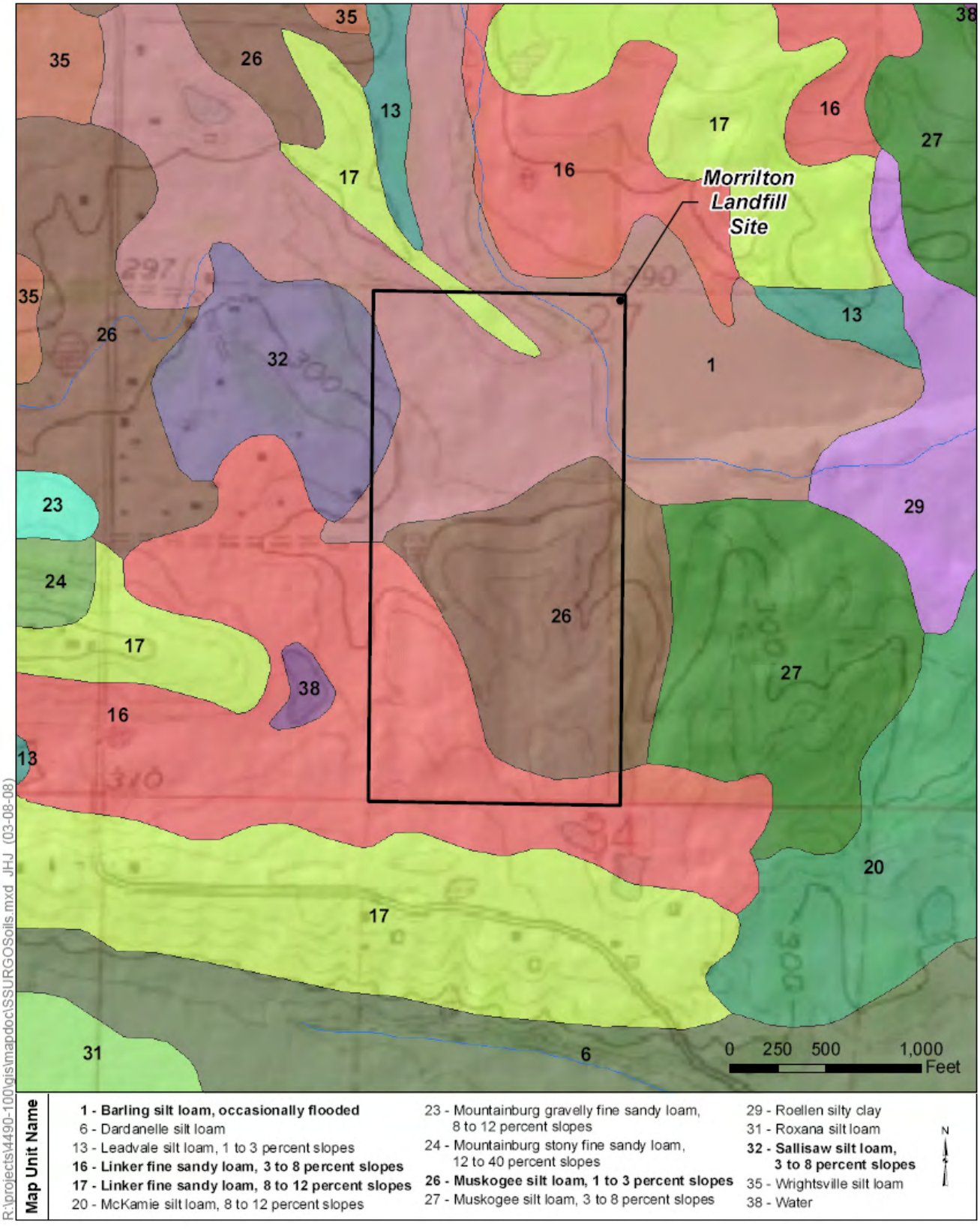


Figure 2.3. USDA (1980) soil survey in the vicinity of the Landfill.

2.4 Site Geology

Based on mapping by the Arkansas Geological Commission, most of the site is mapped as Quaternary Terrace deposits. A small portion in the southwest quadrant is mapped as outcrops of the Pennsylvanian-age Upper Atoka Formation. The Atoka Formation underlies the terrace deposits and consists of alternating beds of sandstone, siltstone, and shale. The shale is black, gritty, and micaceous and commonly underlies lowlands because it erodes easily, relative to the sandstones and siltstones of the formation. The grains of the sandstone and siltstone beds may be tightly cemented with silica, forming hard resistant rocks that produce ridges. A geotechnical investigation of the site that was performed in 1989 (Grubbs et al. 1990) generally described the stratigraphic materials as follows:

1. Stratum 1 — Topsoil

   This stratum is approximately 1 to 2 ft thick and consists of stiff to very stiff tan and gray clayey silt.

2. Stratum 2 — Clay, Silty Clay, and Sandy Clay (Quaternary Terrace Deposits)

   Stratum 2 occurs at the ground surface or beneath the topsoil to depths of 3 to 21 ft. It is generally stiff to very stiff and reddish tan, tan, or gray in color. One boring at the south-central boundary of the Landfill encountered a medium dense, reddish tan and tan, clayey sand between 11.5 and 16 ft below ground surface (bgs).

3. Stratum 3 — Weathered Shale (Weathered Upper Atoka Formation)

   This stratum is described as soft, weathered shale that is gray, tan, and dark gray in color. The unit becomes less weathered, less clayey, and harder with depth.

4. Stratum 4 — Shale (Upper Atoka Formation)

   The basal stratum occurs as a medium soft to medium hard dark gray shale.

2.5 Site Hydrogeology

The fractured shale bedrock comprises the uppermost aquifer at the site and appears to be semi-confined to confined. Monitoring wells at the facility are screened within the shale and top-of-screen elevations in monitoring wells at the site range from 262.8 to 294.0 ft NGVD. Depths to the top of screened intervals in the monitoring wells range from 20.0 to 30.0 ft bgs.

Depths to groundwater at the landfill site (measured in May 2007) ranged from 6.83 to 18.89 ft bgs, with elevations of the potentiometric surface ranging from 286.35 to 305.5 ft NGVD.

Groundwater flow beneath the Landfill is principally to the north/northeast. Estimated hydraulic conductivity is about 1.0×10^{-5} cm/sec based on variable-head tests results performed on two piezometers (Grubbs et al. 1990). The average groundwater velocities are estimated to range from 3.61×10^{-7} cm/sec (1.02×10^{-3} ft/day) to 2.17×10^{-6} cm/sec (6.14×10^{-3} ft/day).

2.6 Climate

Data recorded by the National Climatic Data Center (NCDC) at Morrilton, Arkansas, from 1919 through 2001 was used to characterize climate conditions at the Landfill. The yearly mean daily maximum temperature is 71.7ºF, with a yearly average daily minimum temperature of 47.6ºF. Annual average precipitation for the area is 48.5 inches.

2.7 Waste Stream

The city of Morrilton Landfill is regulated as a Class 1 sanitary (municipal) landfill. The city has also operated a Class 4 landfill on the same property that will be closed when it reaches its permitted capacity. At that time, Class 4 wastes will then be co-disposed in the Class 1 landfill. (As of December 2007, the Class 4 landfill is estimated to have a remaining life of approximately 2 years.) Based on data from the 2007 reporting period, about 37,600 tons of Class 1 waste and 2,600 tons of Class 4 waste were received at the facility during 2007.

3.0 GAS MONITORING SYSTEM

3.1 Rationale for System Layout

Gas monitoring at the site is currently conducted at barholes probes that are pushed during each event. Locations of proposed permanent gas monitoring probes have been located approximately where barhole probes have historically been monitored and are shown on Figure 3.1. It is anticipated that the permanent probes will be installed when this GMP is approved by the Arkansas Department of Environmental Quality (ADEQ). The permanent probes have been located along the property boundary in areas where gas migration is most likely to occur or to become a threat to the public or the environment. Probes will be located such that there is not more than 50 linear feet between the probe and the facility boundary. The proposed locations of the probes are intended to monitor the currently permitted disposal area.

The probes will be slotted across geologic features that would be likely to transmit gas and are generally spaced approximately 600 to 1,000 ft apart. The proposed depth of the probes vary, but the bottom of the slots will be installed at an approximate elevation of 291 ft NGVD to correspond to the lowest elevation of waste in the disposal cells at the facility.

3.2 Explosive Gas Monitoring Probe Installation

Gas monitoring probe installation will be performed under the direction of an Arkansas-registered Professional Geologist or an Arkansas-registered Professional Engineer. Probe holes will be advanced using direct-push techniques (DPT) with a nominal 2-inch borehole. All the borings will be continuously monitored and logged by a qualified geologist and the soils will be described and identified according to ASTM D 2488 (Unified Soil Conservation Service). Boring logs and probe construction reports will be submitted to ADEQ following installation. Depending on actual conditions, changes in depth and construction of the probes may occur during installation.

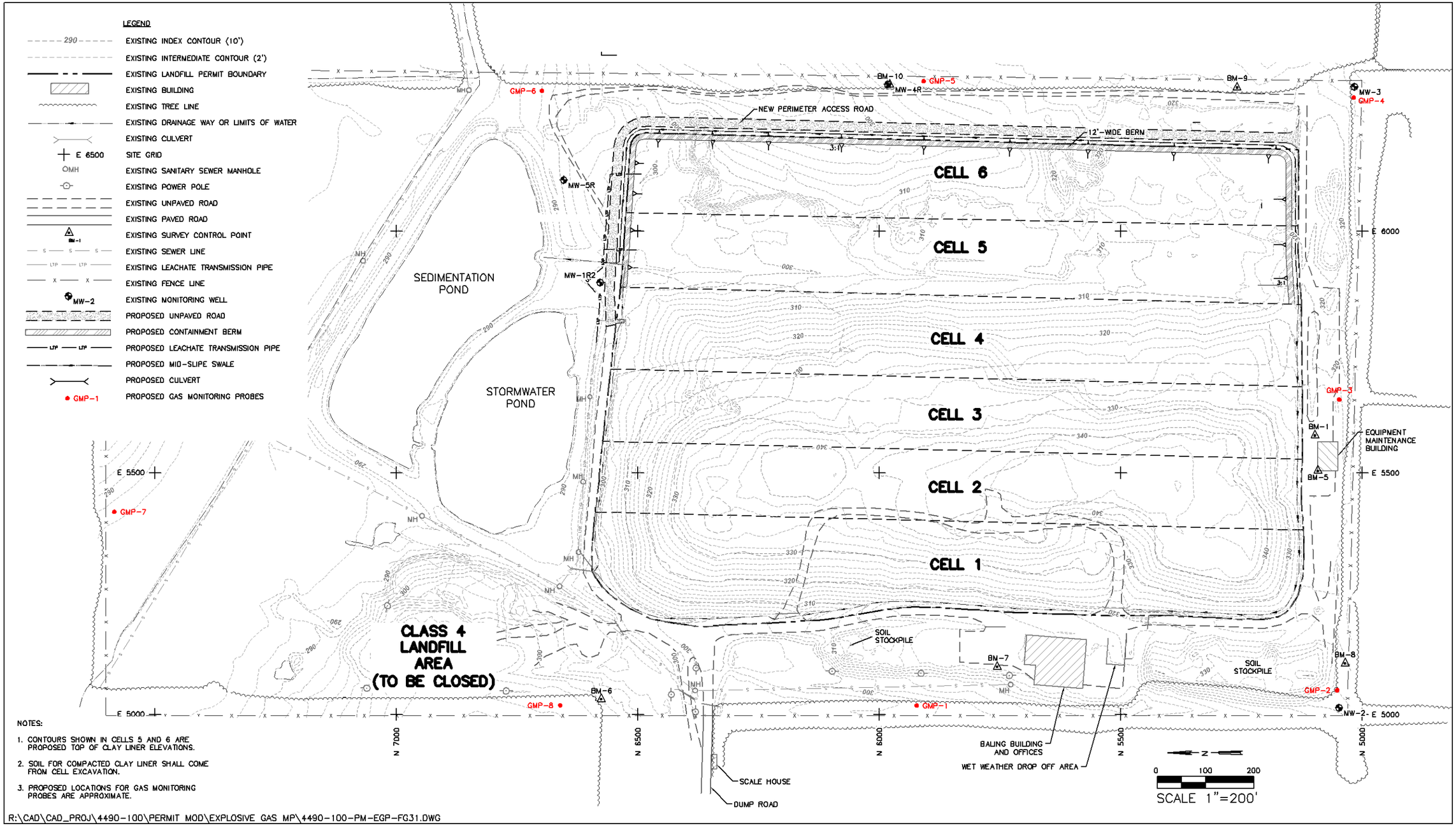


Figure 3.1. Explosive gas monitoring probe locations.

3.3 Probe Design

This section describes permanent probe design. Because the site exhibits rolling topography and the lowest elevation of waste is approximately 291 ft NGVD, the probes will be completed at varying depths corresponding to this elevation. Slotted pipe lengths will vary but will generally extend from 5 ft bgs to total probe depth. A typical probe design is shown on Figure 3.2.

The probes will be constructed with the following components:

1. Probes will be constructed of 0.50-inch nominal inside diameter (ID) Schedule 40, flush-threaded polyvinyl chloride (PVC) casing and slotted pipe, with screw joints and o-ring connections. The base of the slotted pipe will have a pointed drive plug. The casing and pipe will be new and kept in a factory-sealed package until use.
2. The casing will be connected to the slotted pipe at 5 ft bgs. The top of the casing will have an approximate 3-ft above-grade stick-up that will be equipped with a sealing quick-connect fitting for pressure measurements and gas sampling. An elevation point will be clearly and permanently marked on the rim of the casing.
3. Slotted pipe lengths for the probes will vary across the facility depending on the elevation of ground surface but will extend to an elevation of approximately 291 ft NGVD, the approximate lowest elevation of waste.
4. A filter pack consisting of 10-20 grade silica sand will be placed into the annular space in a manner that avoids bridging. The filter pack will extend from the base of the boring to 4.5 ft bgs, placing the upper limit of the filter pack at 0.5 ft above the top of the gas monitoring probe slotted pipe.
5. The annular bentonite pellet seal will extend from the top of the filter pack to the ground surface. The annular seal will be given sufficient time to completely hydrate before continuing with probe completion.
6. Probes caps will be installed that have a valved sampling port for the direct attachment of the gas-sampling instrument, so that samples may be drawn directly from the well.
7. Probe identification will be clearly marked on casings and the elevation "reference points" will be notched or marked on the PVC riser.
8. A continuous Portland cement seal will form a concrete pad at the surface with minimum horizontal dimensions of 3 ft by 3 ft, and a minimum thickness of 4 inches.
9. The size of the protective steel casing will be 4 inches by 4 inches and will penetrate through the concrete seal. The top of the protective casing will extend

approximately 3.5 ft above the surface, leaving about 6 inches of space above the top of the casing. The collar will have a locking hinged lid and a lock and will be permanently marked on the outside with the GMP number.

10. For each probe, four protective barrier pipes (bollards) will be offset 1 ft from the concrete pad. The protective pipes will be 4 inches in diameter and set 2 ft into concrete.

Should site conditions preclude the installation of gas probes using DPT, a hollow-stem auger drill rig will be utilized for advancing boreholes. Borehole diameter will be between 6 and 8 inches and 2-inch nominal diameter PVC casing and slotted pipe will be used in the construction. Other elements of probe design and construction will be the same.

3.4 Gas Monitoring Probe Location Survey

As-built elevations and locations of all gas monitoring probes will be determined by an Arkansas-registered land surveyor. The data will include the horizontal location of each probe and elevations of both the top of the PVC casing and the adjacent natural ground surface. Probe identification will be clearly marked on casings and the elevation “reference points” will be notched or marked on the PVC riser.

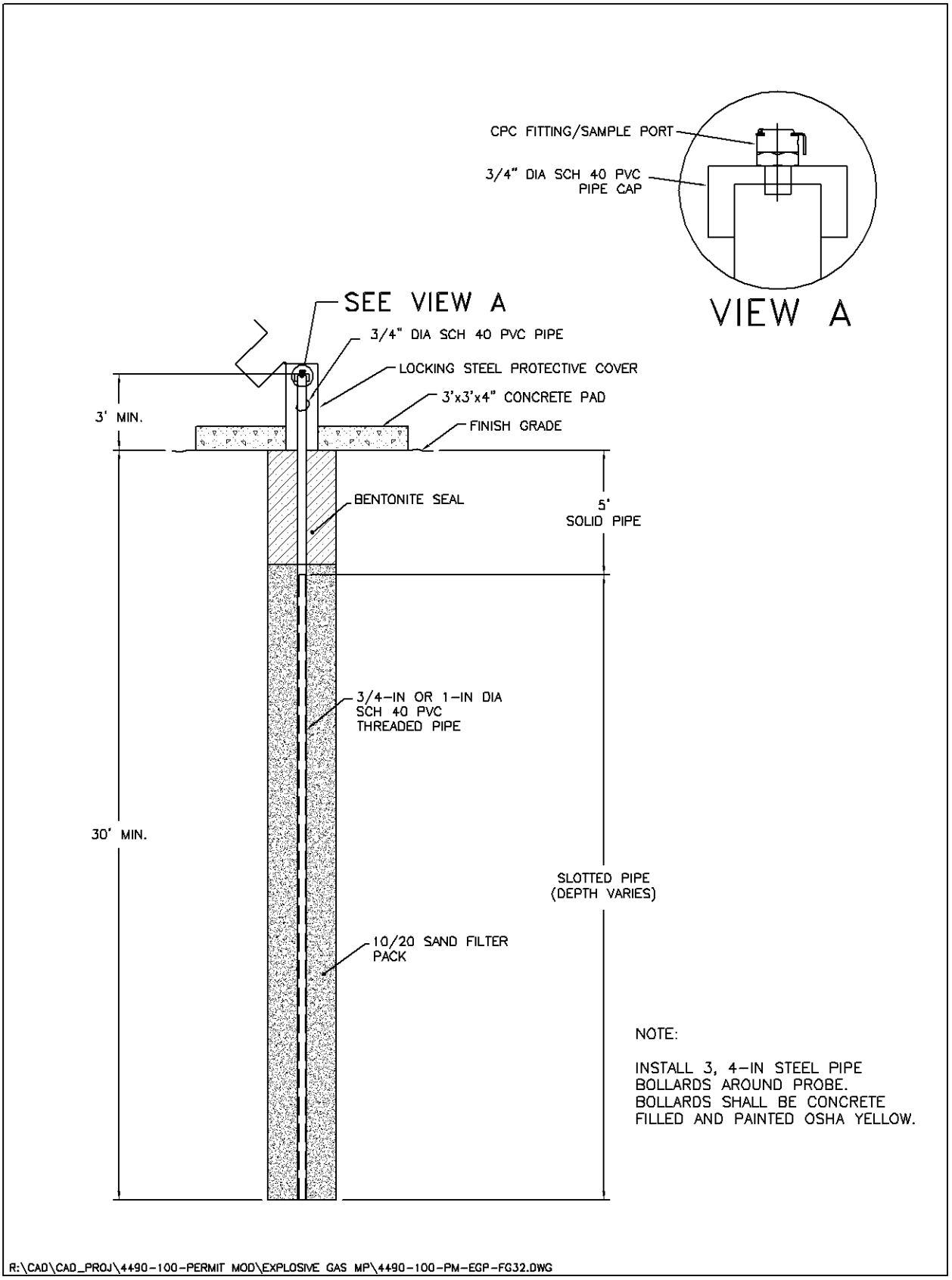


Figure 3.2. Typical explosive gas monitoring probe design.

4.0 EXPLOSIVE GAS MONITORING

4.1 Monitoring Frequency

In accordance with §22.415(b)(2) of Regulation 22, the routine monitoring frequency for the facility shall be once per quarter. Should elevated levels be detected at the facility, the monitoring frequency will be increased. The revised monitoring frequency will be specified in the written remediation plan that is required by §22.415(d)(3).

4.2 Sampling Equipment

Field sampling and monitoring will be conducted using the following instruments, or instruments with equivalent specifications and performance:

1. LandGEM Model 500 or equivalent gas monitoring instrument. Must be capable of monitoring percent methane and percent oxygen as well as percent LEL methane and pressure. NOTE: Some direct reading methane monitoring instruments require that a minimum oxygen concentration be present to operate properly. Knowledge of a given instrument's requirements and limitations is necessary;
2. Water level meter (Solinst Model 101, electronic); and
3. Thermometer (quick-read dial type).

4.3 Probe Inspection and Maintenance

Inspection and maintenance of monitoring probes will be performed during each quarterly sampling event. Each monitoring probe will be inspected upon arrival for any damage to identification number, protective barrier pipes, working pad, lock, and hinged cover, and any damage will be noted on the field sampling record. The top of the casing and fittings will also be inspected for damage. Damages will be repaired as soon as practicable. On a semiannual basis, water levels will be checked and recorded for each probe to determine if the slotted interval is blocked by water.

4.4 Probe Monitoring Procedure

The probes will be tested for the following parameters:

1. Probe gas pressure,
2. Probe gas temperature, and
3. Methane gas concentration.

Barometric pressure and ambient temperature will also be recorded. A list of procedures to be followed in performing monitoring activities is given below.

Preparatory Activities:

1. Prepare field sampling records,
2. Calibrate field instrument, and
3. Review map of probe locations.

Gas Probe Monitoring Procedures:

1. Perform monitoring probe inspection and maintenance check,
2. Connect instrument and determine pressure within the probe,
3. Start pump on instrument and make an initial explosive gas (percent methane) reading within sealed monitoring probe, and
4. Record all technical data on the Explosive Gas Monitoring Event Data Sheet included in Attachment 1.

4.5 Enclosed Structure Monitoring Procedure

Gas monitoring will be conducted in onsite enclosed structures located adjacent to waste disposal areas, specifically the Scale House, office/baling building, and the equipment maintenance building. The Scale House and other buildings will be monitored once per quarter with a portable instrument at the following locations:

1. The base of each exterior wall,
2. Underground utility lines leading into the building, and
3. Ambient air in each room of the building.

4.6 Recordkeeping

In accordance with §22.421 requirements, gas monitoring results from monitoring and any remediation plans required by §22.415 will be permanently maintained in the facility's permanent operating record (POR) unless destruction of the records is authorized by ADEQ following completion of the post-closure care period. Explosive gas monitoring records will be maintained that identify the test results, date of testing, test location, person performing the tests, local conditions that may impact results, and any measures taken to mitigate hazards from explosive gases. These records will be available for inspection at the facility.

5.0 CONTINGENCY PLAN

5.1 Action Levels

This GMP describes the proposed gas monitoring program that will be implemented to ensure that the following action levels for methane are not exceeded at the facility. The action levels are as follows:

1. The concentration of methane gas generated by the facility exceeding 25% of the LEL for methane in facility structures; and
2. The concentration of methane gas exceeding the LEL for methane at the facility property boundary.

5.2 Exceedence of Action Levels

5.2.1 Exceedence Within Structures

Should monitoring indicate that the action level of 25% LEL for methane has been exceeded within a structure at the facility, immediate action must be taken to ensure the protection of workers present at the site. The following measures should be implemented immediately:

1. Notify all occupants of structure and evacuate the structure;
2. Eliminate all sources of possible ignition (pilot lights, furnaces, electrical equipment, etc.);
3. Increase fresh air ventilation of structure (open doors and windows, open foundation vents, and remove underpinning covers);
4. Perform a thorough monitoring investigation of structure by checking all potential avenues for landfill gas intrusion into the structure to identify source; and
5. Notify ADEQ.

Place monitoring records in the facility's POR within 7 days of completion of monitoring.

5.2.2 Exceedence at the Property Boundary

Should monitoring indicate that the action level of 100% LEL for methane has been exceeded within a monitoring probe at the facility. ADEQ must be notified and copies of all monitoring records must be placed in the facility's POR within 7 days of completion of monitoring.

5.3 Required Notifications

5.3.1 Initial Notifications

Should monitoring indicate that the action levels listed in Section 5.1 have been exceeded, the following notifications are to be made. Contact information for the persons to be notified is included in Attachment 2.

1. Person performing the monitoring shall immediately notify the Landfill Supervisor. Should the Landfill Supervisor not be available, notification should be made to the Scale House operator; and
2. The Landfill Supervisor must notify ADEQ immediately if a monitoring exceedence is detected. Notification can be made by phone call during normal business hours or by facsimile if after normal business hours.

5.3.2 Documentation Required

Within 7 days of an exceedence, written documentation of the detection and description of steps taken to protect human health must be placed in the facility's POR.

5.4 Development of Remediation Plan

Within 60 days of detection, the facility is required to develop and implement a written remediation plan for the methane gas exceedences. The plan shall describe the nature and extent of the methane detection and steps to be taken to remediate the problem. A copy of the written plan must be placed in the facility's POR and a copy must be sent to ADEQ.

6.0 REFERENCES

Grubbs, Garner & Hoskyn, Inc. 1990. Geotechnical & Ground Water Study, Proposed Sanitary Landfill, Morrilton, Arkansas. Prepared for Garver & Garver, Inc. Little Rock, Arkansas.

USDA. 1980. *Soil Survey of Conway County, Arkansas*. United States Department of Agriculture, Soil Conservation Service, 91 p., 50 plates.

ATTACHMENT 1

Explosive Gas Monitoring Event Data Sheet

City of Morrilton
Class 1 Landfill
Explosive Gas Monitoring Record

Equipment Used:_____

Date:_____

Weather Conditions:_____

Monitoring Location	Criteria	Methane % LEL	Oxygen %	Reading Time	Comments
GMP-1	100 % LEL				
GMP-2	100 % LEL				
GMP-3	100 % LEL				
GMP-4	100 % LEL				
GMP-5	100 % LEL				
GMP-6	100 % LEL				
GMP-7	100 % LEL				
GMP-8	100 % LEL				
Former Baling Building	25% LEL				
Equipment Maintenance Building	25% LEL				
Office/Scale House	25% LEL				

Conducted by:_____

ATTACHMENT 2

Notification Information

City of Morrilton
Class 1 Landfill
Explosive Gas Monitoring Plan
Notification Information

City of Morrilton Landfill

Landfill Supervisor: Eugene Edwards
Office Phone: 501-354-5299
Mobile Phone: 501-215-7127

Mayor: Bobby Kirby
Office Phone: 501-354-1556
Office Fax: 501-354-6475
Office Email: mayorkirby@suddenlinkmail.com

Scale House Operator: Terry Bryant
Office Phone: 501-354-5299
Office Email: landfill1@sbcglobal.net

Arkansas Department of Environmental Quality

Solid Waste Management Division Chief
Office Phone: 501-682-0600
Office Fax: 501-682-0611

Solid Waste Management Division Technical Branch Manager
Office Phone: 501-682-0601
Office Fax: 501-682-0611

Mailing Address:

Arkansas Department of Environmental Quality
Solid Waste Management Division
5301 Northshore Drive
North Little Rock, AR 72118-5317

CLOSURE AND POST-CLOSURE CARE PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

REVISED
JULY 14, 2008

CLOSURE AND POST-CLOSURE CARE PLAN
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

Prepared for

City of Morrilton
210 North Moose Street
Morrilton, AR 72110

Prepared by

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3 Innwood Circle; Suite 220
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REVISED
July 14, 2008

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1.0 INTRODUCTION

The City of Morrilton Class 1 Landfill (the Landfill) is located in Conway County, about 2 miles southeast of Morrilton. The location of the landfill facility is shown on Figure 1.

The Landfill was permitted in June 1991. The permitted landfill area is located as shown on Figure 2. The existing landfill encompasses approximately 80 acres, of which approximately 30 acres is used for Class 1 waste disposal with the remaining area used for buffer zones and access roads around the perimeter of the waste disposal area, stormwater ponds, and a Class 4 landfill that will be closed.

As of April 2008, waste had been placed in Cells 1 through 4, with remaining capacity in each constructed cell except Cell 1.

This Closure and Post-Closure Care Plan addresses Chapters 13 and 14 of the Arkansas Pollution Control and Ecology Commission (APCEC) Regulation No. 22 (Regulation No. 22). These references state the requirements for closure and post-closure care of a Class 1 landfill. Section number references are included throughout this plan to identify the applicable section of Regulation No. 22 being addressed. This plan includes a description of the steps that will be taken to close each landfill unit, a general schedule for closure, a description of the final cover system and the methods used to install the cover, and a description of post-closure care activities. Information supplemental to this plan, such as full-scale landfill design, is included in the facility permit and subsequent modifications. A copy of the plan will be placed in the facility's permanent operating record (POR) (§22.1301(d)).

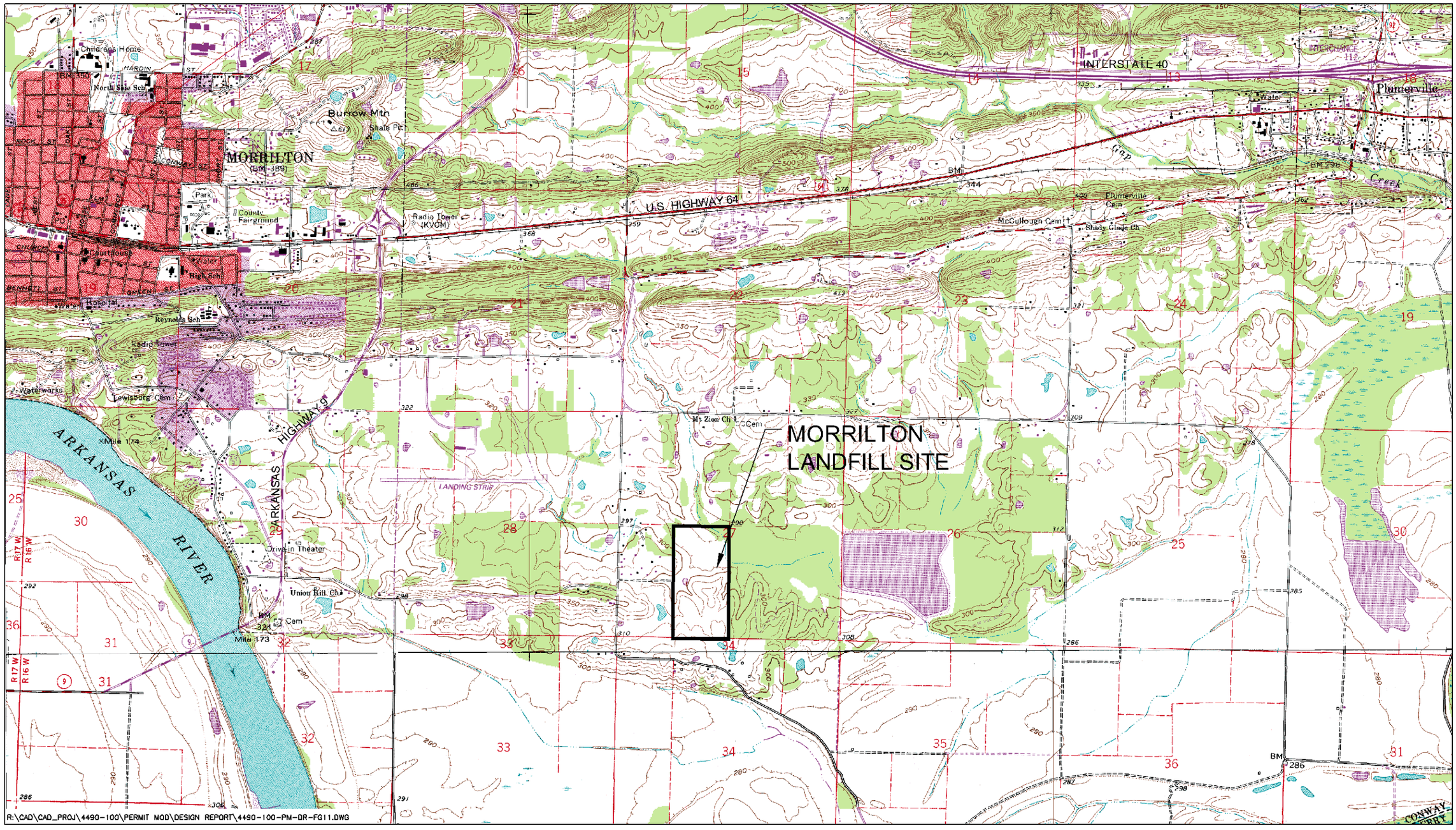


Figure 1. Site location map.

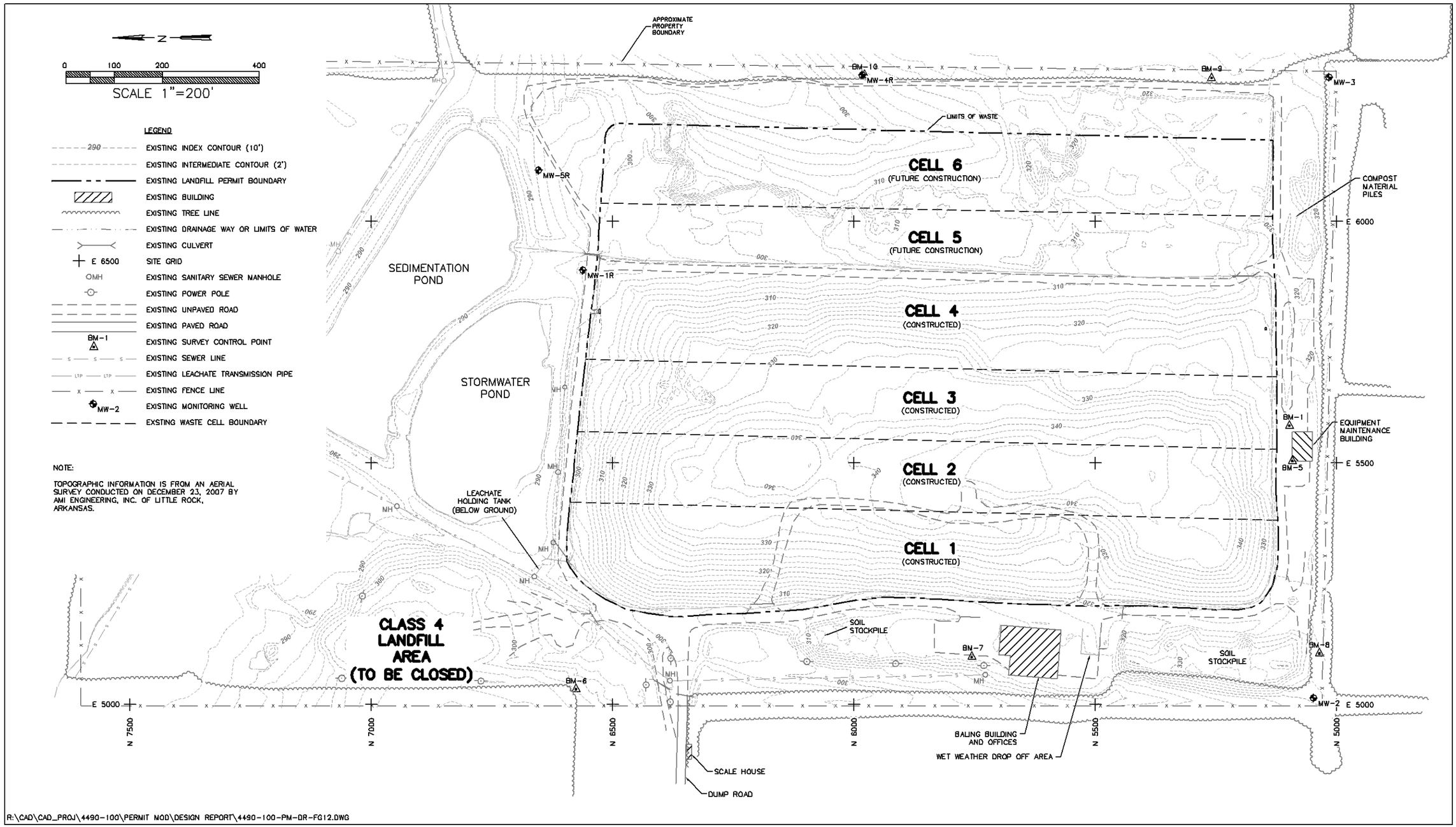


Figure 2. Site map.

2.0 CLOSURE PLAN

2.1 Closure Requirements

2.1.1 Notification Requirements

The city of Morrilton will notify ADEQ when the Landfill stops receiving waste for disposal. The Solid Waste Management Division (SWMD) of the ADEQ will be notified prior to the beginning closure of each unit that the intent to close the unit has been placed in the facility POR (§22.1301(e)).

2.1.2 Estimated Closure Costs

In accordance with §22.1402, estimated costs for closing the landfill facility have been developed. The estimated closure costs are based on hiring a third party to close the largest area ever requiring a final cover at any time during the active life of the facility. However, the closure costs are based on closure of the current open area (approximately 22 acres) consisting of Cells 1, 2, 3, and 4. Estimated closure costs for Cells 1 through 4 are included as Attachment 1.

Cells 1 through 6 will be closed with the cover system described in Section 2.2 of this plan.

2.1.3 Facility Recordkeeping and Report Requirements

A copy of the approved plan will be kept in the facility POR (§22.421(a)(6)). The city of Morrilton will permanently maintain the records until the Director of ADEQ authorizes destruction of the records following the completion of the post-closure monitoring period (§22.421(i)). The city of Morrilton will provide the initial and updated closure and post-closure cost estimates, described in Sections 2.1.2 and 3.3 respectively, to the SWMD of ADEQ and place them in the POR (§22.421(a)(7)).

2.1.4 Financial Assurance

Evidence of the financial assurance mechanism for closure and post-closure care costs is included in the Permit Modification Application and is in the facility POR. The city has

established a trust fund for their financial assurance mechanism. Continuous coverage for closure and post-closure care must be provided until the facility is released from financial assurance requirements by demonstrating compliance with grading, surveying, and post-closure notification.

2.2 Closure Cover Design And Installation

2.2.1 Permitted Final Cover Design

Regulation No. 22, §22.1301 requires that the final cover system include an infiltration layer of a minimum of 18 inches of earthen material that has a permeability less than or equal to the permeability of any bottom liner system or natural subsoils. A flexible membrane liner (FML) must be incorporated into the final cover design where the bottom liner design includes a composite liner. An alternative final cover design may also be approved that includes an infiltration layer that achieves an equivalent reduction in infiltration. The typical final cover system associated with Cells 1 through 6 will consist of the following configuration from bottom to top:

- Eighteen inches of compacted clay soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec;
- An FML consisting of a minimum 40-mil linear low-density polyethylene (LLDPE) liner;
- A geocomposite drainage layer; and
- A 12-inch layer of soil vegetated with native perennial grasses.

An alternate cover system for these waste cells may include a geosynthetic clay liner (GCL) system, as shown in Attachment 2, in lieu of the compacted native soils.

The cover system will be installed by the city of Morrilton or by an earthwork contractor hired by the city of Morrilton. Cover construction will be scheduled to occur during the spring, summer, or fall months. Upon completion of installation of the cover soils, the area will be immediately seeded. The vegetative cover will be maintained to prevent erosion of cover soils.

The cover system construction will be monitored and documented in accordance with the Construction Quality Assurance and Quality Control (CQA/QC) Plan for the Landfill (May 2008). A copy of this CQA/QC Plan is included as Appendix H of the Permit Modification Application. Documents related to final cover system construction activities will be placed in the facility POR, and ADEQ will be notified of such activity.

Upon completion of the installation of the final cover system over the entire Landfill, the site will be surveyed by an Arkansas-registered Professional Engineer or Surveyor to document the final elevations of the Landfill, the location of the surface improvements, site boundaries, and areas that received waste (§22.1301(i)). Final closure of the site will be achieved when all currently permitted cells have been filled and have the final cover system installed. Closure will be considered complete after the final cover has been inspected and approved by ADEQ.

The final cover plan and typical final cover details for the Landfill are included in Attachment 2 of this plan.

2.2.2 Construction Specifications

As each waste cell approaches design capacity, the city of Morrilton or the earthwork contractor will begin to excavate the successive waste cell area to the permitted dimensions. The excavated soils will be stockpiled in preparation for cover construction activities. The stockpiles will be maintained to minimize erosion problems.

The landfill cover system will be installed during the spring, summer, or fall months to minimize wet weather problems. Prior to installing the cover system, the city of Morrilton or the earthwork contractor will grade the side slopes of the waste area to meet the design requirements.

The cover system materials will meet the requirements of the final cover system design. After installation of the cover system, the vegetative cover will be established.

Cover system installation activities will include:

- The installation and testing of the cover system layers in accordance with the facility CQA/QC Plan;
- The installation of the erosion layer;

- The establishment of vegetation over completed areas; and
- The development of a certification report by an Arkansas-registered Professional Engineer which will include a summary of all construction activities, a description of installed items and materials used, an "as-built" plan at a scale of 1 inch equals 100 ft or less, and a summary statement signed and sealed by the certifying professional.

Soil borrow areas will be managed with best management practices (BMPs) during its active operation. The areas will be closed with maximum slopes of 33.3% (three horizontal to one vertical) and re-vegetated with a good stand of grass.

2.2.3 CQA/QC

Construction of the final cover system is outlined in the facility CQA/QC Plan. It describes the steps necessary for closure construction activities of the Landfill at any point during its active life in accordance with the final cover design requirements.

In accordance with the plan, all cover system construction activities will be monitored and documented to assure that the system complies with the permit requirements. The certification document of the construction activities will be placed in the facility POR when completed.

2.2.4 Erosion Control Measures

Erosion control measures such as hay bale checks, silt fences, or erosion control matting will be installed in areas where excessive erosion may occur such as side slopes, discharge locations of stormwater structures, and drainage channels.

2.3 Closure Schedule

Closure of the Landfill will generally begin within 30 days following the final receipt of waste, or if the Landfill has remaining capacity and there is a reasonable likelihood that it will receive additional wastes, no later than 1 year after the most recent receipt of waste. Currently,

Cells 1 through 4 are open. An estimated schedule for completing all activities necessary for closure, based on the 22-acre area that is currently open, is presented in Table 1.

Table 1. Estimated closure schedule for current open area.

Closure Activity/Tasks	Number of Days to Complete
Perform grading of waste	20
Install final cover system	90
Grade soil borrow areas and prepare for seeding	5
Seed and mulch	10
Installation of erosion and sediment control structures	20
Estimated Total Time to Complete Closure	145

Closure of the Landfill will be completed no later than 180 days following the beginning of closure activities. The Director of ADEQ may extend this schedule, if necessary, due to inclement weather or other circumstances (§22.1301(g)).

2.4 Closure Documentation

2.4.1 Land Use Restrictions

Following placement of final cover over the entire landfill, a notation will be recorded on the deed to the landfill facility property. The city of Morrilton will then notify the SWMD of ADEQ that the notation has been recorded and a copy has been placed in the POR. The notation on the deed must inform any potential purchaser of the property of the following:

- The past use of the land was a landfill facility;
- Any future use shall comply with ADEQ regulations and shall not disturb the integrity of the final cover system or any other components of the containment or monitoring system; and
- It shall be unlawful for any person, partnership, company, corporation or other entity to build, erect, or construct any house, home, or building to be used for residential purposes.

The restriction of residential construction applies only to the areas actually used for solid waste disposal. The owner may request permission from ADEQ to remove the notation from the deed if all wastes are removed from the facility (§22.1301(j) and (k)).

2.5 Closure Certification

Following closure of the Landfill, the city of Morrilton will furnish the SWMD of ADEQ with a certification, signed by an Arkansas-registered Professional Engineer, verifying that closure has been completed in accordance with the plan and that this certification has been placed in the POR. A final closure report shall accompany the certification that includes:

- The final survey in accordance with §22.1301(i);
- CQA/QC data documenting proper construction and installation of the cover system;
- A copy of the deed notation required under §22.1301(j); and
- Other information that ADEQ may deem necessary to making the certification.

3.0 POST-CLOSURE PLAN

The post-closure period will be 30 years following the date of written confirmation by ADEQ that the site has been closed in accordance with the approved plan, unless the period is decreased or increased by the Director of ADEQ (§22.1302(c)(3)). The period may be decreased if the city of Morrilton demonstrates that the reduced period is sufficient to protect human health and the environment and if the Director of ADEQ approves the reduced period (§22.1302(c)(4)(i)). The period may be increased if the Director determines that the lengthened period is necessary to protect human health and the environment (§22.1302(c)(4)(ii)). During the post-closure care period, the closure cover will be maintained and monitoring activities will be performed as described in the following subsections.

3.1 Post-Closure Monitoring and Maintenance

The integrity of the final cover will be maintained, including the repair of the cover, as necessary to correct the effects of settlement, subsidence, and erosion, and prevent runoff and run-on from damaging the cover. Vegetation shall be mowed at least annually to control the growth of unwanted vegetation that may interfere with the integrity of the landfill cap. All cracked, eroded and uneven areas must be filled and reseeded and the ditches maintained (§22.1302(b)(1)).

Leachate sampling and analysis will be conducted on a semi-annual basis during the 30-year post-closure care period, unless the Director approves decreasing the frequency because historical data indicate little variation in the concentration of detected constituents (§22.429(l)(3)(ii)). Groundwater monitoring will be performed semiannually throughout the post-closure period (§22.1302(b)(3)).

The gas monitoring system will be maintained in accordance with the requirements of §22.415. The gas collection and processing system will be maintained and operated, if installed. Surface water control systems will be maintained and operated in accordance with §22.419 and §22.427.

Access to the site after closure will be controlled through maintenance of existing fencing and signs, and all access gates will be locked to discourage unauthorized entry.

3.2 Contact Persons

The name, address, and telephone number of the person to contact about the facility during the post-closure period will be provided upon notice of closure.

3.3 Post-Closure Cost Estimate

An estimate of the cost of performing post-closure activities, based on the estimated cost of hiring a third party to conduct the activities is presented in Attachment 3. During the life of the Landfill, the city of Morrilton will annually adjust the post-closure cost estimate for inflation.

3.4 Site Management and Use

Upon completion of post-closure care, the city of Morrilton intends to allow the land to revert back to open grassland. The actual long-term use of the land will be determined upon notice of closure. The final landfill cover will not be disturbed without prior approval from the Director of ADEQ.

3.5 Certification of Completion

Following the completion of the post-closure care period for the landfill facility, the city of Morrilton will notify the SWMD of ADEQ that a certification has been placed in the POR. The certification, signed by an independent Arkansas-registered Professional Engineer and approved by ADEQ, will verify that post-closure care has been completed in accordance with the plan (§22.1302(f)).

ATTACHMENT 1

Estimated Closure Costs

CLOSURE COST ESTIMATE
CITY OF MORRILTON - CLASS 1 LANDFILL
PERMIT NO. 0257-S

ITEM	QUANTITY	UNIT	UNIT PRICE	AMOUNT
Surface Preparation [1]	22.0	AC	$ 600.00	$ 13,200.00
Clay Cover (24 inches) [2]	93,000	CY	$ 5.00	$ 465,000.00
Random Cover (24 inches) [2]	93,000	CY	$ 3.00	$ 279,000.00
Seeding/Fertilizing/Mulching	22.0	AC	$ 2,500.00	$ 55,000.00
Erosion Control [3]	1	LS	$ 20,000.00	$ 20,000.00
Quality Assurance/Quality Control [4]	1	LS	$ 80,000.00	$ 80,000.00
Engineering	1	LS	$ 30,000.00	$ 30,000.00
Surveying	1	LS	$ 10,000.00	$ 10,000.00
Certification [5]	1	LS	$ 5,000.00	$ 5,000.00
Side Slope Berms and Letdown Structures	1	LS	$ 30,000.00	$ 30,000.00
TOTAL				**$ 987,200.00**

Notes:

All costs are in 2008 Dollars

1 - The current area that has not been closed includes Cells 1, 2, 3, and 4, which is approximately 22 acres.

2 - The permitted final cover system design (Garver+Garver 1991) includes 24-inches of compacted clay and 24-inches of random (protective) cover.

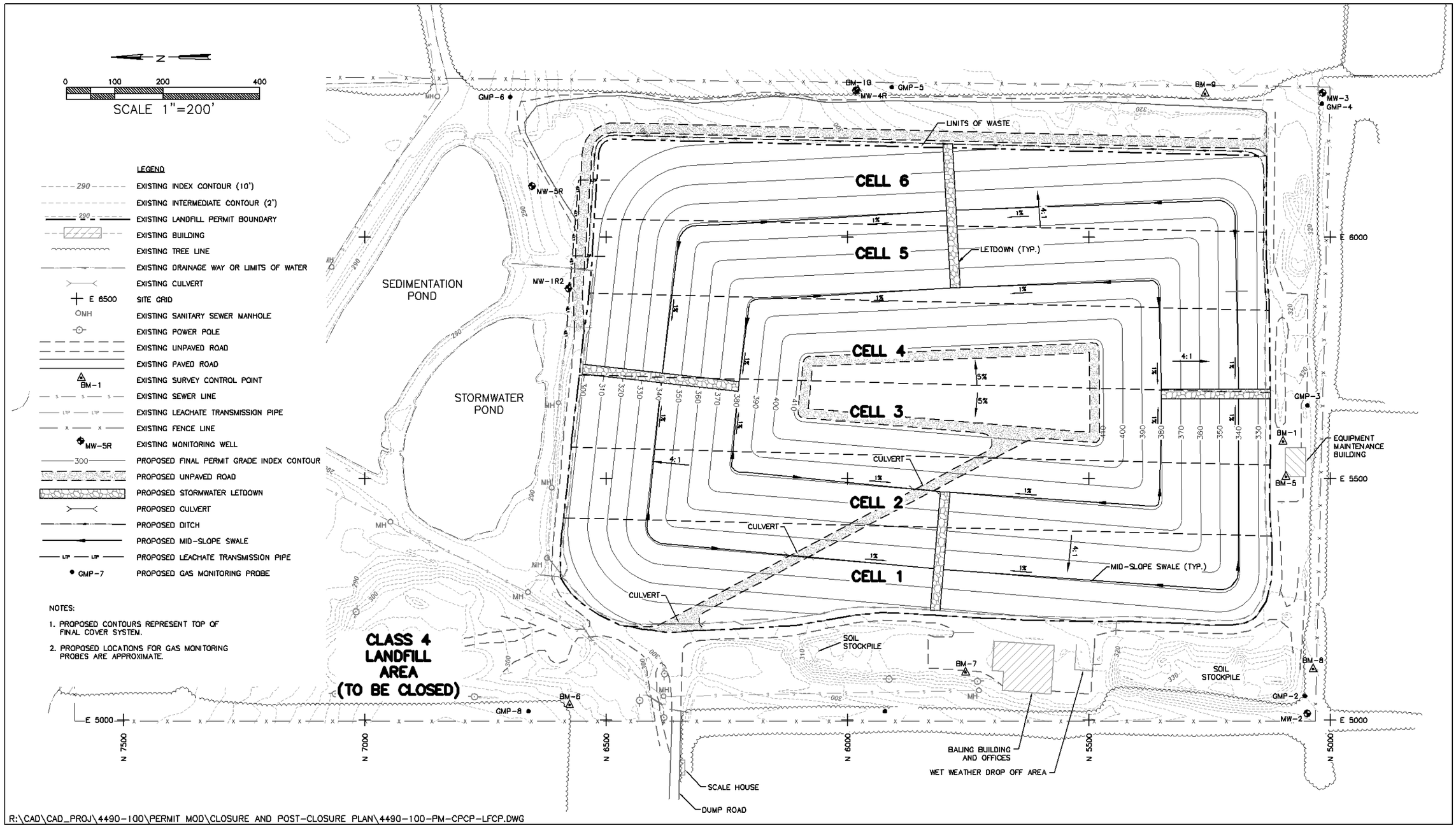
3 - Includes erosion control matting, silt fencing, and hay bales.

4 - Includes monitoring construction activities and quality control testing of soil materials.

5 - Includes engineering certification and reporting of final closure activities.

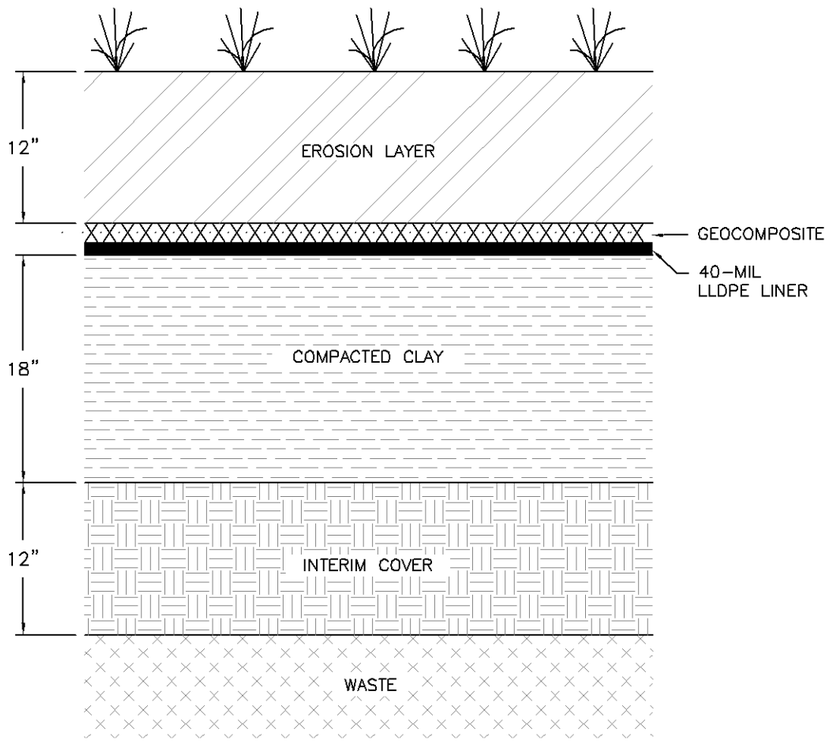
ATTACHMENT 2

Landfill Final Cover Plan and Landfill Final Cover Options

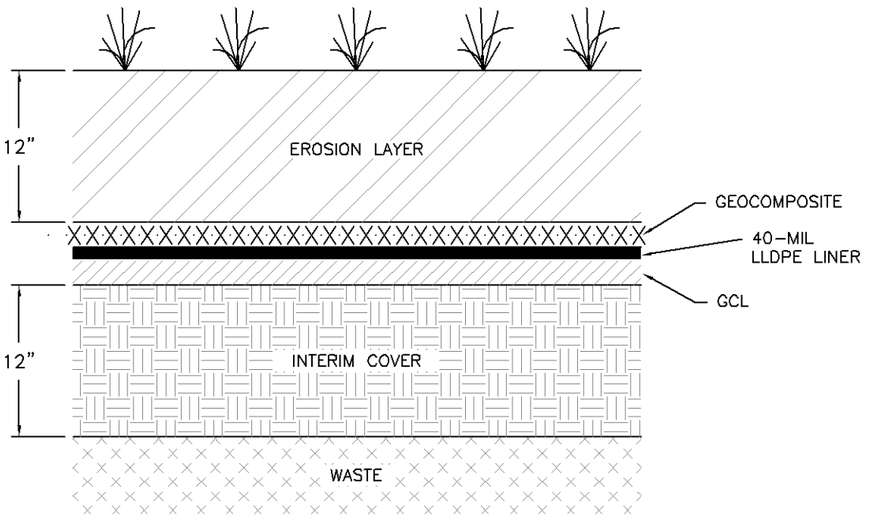


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Final cover plan.



COMPACTED CLAY OPTION



GCL OPTION

SCALE: 1"=1'–0"

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Landfill final cover options.

ATTACHMENT 3

Estimated Post-Closure Care Costs

POST-CLOSURE CARE COST ESTIMATE
CITY OF MORRILTON - CLASS 1 LANDFILL
PERMIT NO. 0257-S

TABLE A				
ANNUAL MISC. REPAIRS (SUBSIDENCE, SETTLING, EROSION, ROADS, ETC.)				
ITEM	**QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
Labor (2 people x 8 hr/day x 2 days/yr)	32	Hours	$ 17.50	$ 560.00
Equipment- Dozer	8	Hours	$ 100.00	$ 800.00
Dump Truck	8	Hours	$ 60.00	$ 480.00
Loader	8	Hours	$ 65.00	$ 520.00
Misc. Materials and Services	1	LS	$ 1,500.00	$ 1,500.00
TOTAL ESTIMATED ANNUAL MISC. REPAIRS				**$ 3,860.00**

TABLE B				
ANNUAL MAINTAINENANCE/OPERATION OF LEACHATE COLLECTION SYSTEM				
ITEM	**QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
Capital Cost of System = $60,000; Estimated life of system = 30 years				
Annual Maintenance and Repair of System = 1/30 of capital cost (1)				$ 2,000.00
Leachate Generation/Yr. (Gallons) (2)	N/A	N/A	N/A	$ -
Annual Transportation Costs (2)	N/A	N/A	N/A	$ -
Annual Treatment Costs (2)	N/A	N/A	N/A	$ -
TOTAL ESTIMATED ANNUAL LEACHATE SYSTEM O&M				**$ 2,000.00**

Notes:
All costs are in 2008 dollars.
(1) - Annual maintenance includes monitoring and sampling of leachate as required by the facility permit.
(2) - Leachate from the landfill gravity flows from the Landfill to the city's wastewater treatment plant via a gravity sewer line.

POST-CLOSURE CARE COST ESTIMATE
CITY OF MORRILTON - CLASS 1 LANDFILL
PERMIT NO. 0257-S

TABLE C				
ANNUAL MAINTAINENANCE/OPERATION OF GROUNDWATER MONITORING SYSTEM				
ITEM	**# of Wells**	**UNIT**	**Cost/Well**	**AMOUNT**
Capital Cost of System: 5 wells at $3,000 = $15,000; assume 30-year life				
Annual Maintenance and Repair (1/30 of Capital Cost)				$ 500.00
Annual Sampling Costs (2/year)	5	Wells	$ 800.00	$ 4,000.00
Annual Laboratory Analysis (2/year)	5	Wells	$ 2,000.00	$ 10,000.00
Statistical Analysis (2/year)	5	Wells	$ 1,500.00	$ 7,500.00
TOTAL ESTIMATED ANNUAL GW MONITORING SYSTEM COSTS				**$ 22,000.00**

TABLE D				
ANNUAL MAINTAINENANCE/OPERATION OF GAS MONITORING SYSTEM				
ITEM	**# of Locations**	**UNIT**	**Cost/Probe**	**AMOUNT**
Capital Cost of System = 3 probes at $800 = $2,400; assume 30-year life (3)				
Annual Maintenance and Repair = 1/30 of capital cost				$ 80.00
Sampling/Analysis Costs (4/year)	3	Probe	$ 500.00	$ 1,500.00
TOTAL ESTIMATED ANNUAL GAS MONITORING SYSTEM COSTS				**$ 1,580.00**

TOTAL ESTIMATED ANNUAL POST-CLOSURE CARE COSTS:	**$29,440**
TOTAL ESTIMATED POST-CLOSURE CARE COSTS (30-YEAR PERIOD):	**$883,200**

Notes:
(3) - Assumes that 3 probes will be installed at the property boundary prior to closure of the Landfill.

PERMIT MODIFICATION APPLICATION
FOR EXPANSION OF THE
CITY OF MORRILTON CLASS 1 LANDFILL
MORRILTON, ARKANSAS
PERMIT NO. 0257-S
AFIN: 15-00034

REVISED
JULY 14, 2008

PERMIT MODIFICATION APPLICATION FOR EXPANSION OF THE CITY OF MORRILTON CLASS 1 LANDFILL MORRILTON, ARKANSAS PERMIT NO. 0257-S AFIN: 15-00034

Prepared for

City of Morrilton
210 North Moose Street
Morrilton, AR 72110

Prepared by

FTN Associates, Ltd.
3 Innwood Circle, Suite 220
Little Rock, AR 72211

FTN No. 4490-100

REVISED
July 14, 2008

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1.0 GENERAL INFORMATION

1.1 Introduction

The city of Morrilton contracted with FTN Associates, Ltd. (FTN) to prepare a permit modification for vertical expansion of the City of Morrilton Class 1 Landfill (the Landfill). This Permit Modification Application has been prepared to upgrade the landfill permit (Permit No. 0257-S) to incorporate regulatory updates and to increase the capacity of the Landfill.

This Permit Modification Application document contains the various demonstrations, operating plans, and supporting documents as required by the Arkansas Pollution Control and Ecology Commission (APCEC) Regulation No. 22 (Regulation No. 22) for the Landfill. Regulatory sections cited herein refer to the most recent update to Regulation No. 22, effective April 2006. The following sections address the various compliance issues related to the Landfill and Regulation No. 22:

1. Section 1.0 provides general background information and the purpose of the Permit Modification Application,
2. Section 2.0 explains site selection limitations and location restrictions,
3. Section 3.0 contains information regarding the Landfill's general operating standards,
4. Section 4.0 addresses the specific design criteria for the Landfill,
5. Section 5.0 presents regional and site-specific geotechnical and hydrogeological information,
6. Section 6.0 addresses groundwater monitoring related to the landfill facility,
7. Section 7.0 describes proposed closure and post-closure care plans for the Landfill, and
8. Section 8.0 provides financial assurance information.

1.2 Facility Information

The existing city of Morrilton landfill facility is located on approximately 80 acres about 2 miles southeast of Morrilton in Conway County, Arkansas, as shown on Figure 1.1. The existing landfill site encompasses approximately 80 acres, of which approximately 30 acres are

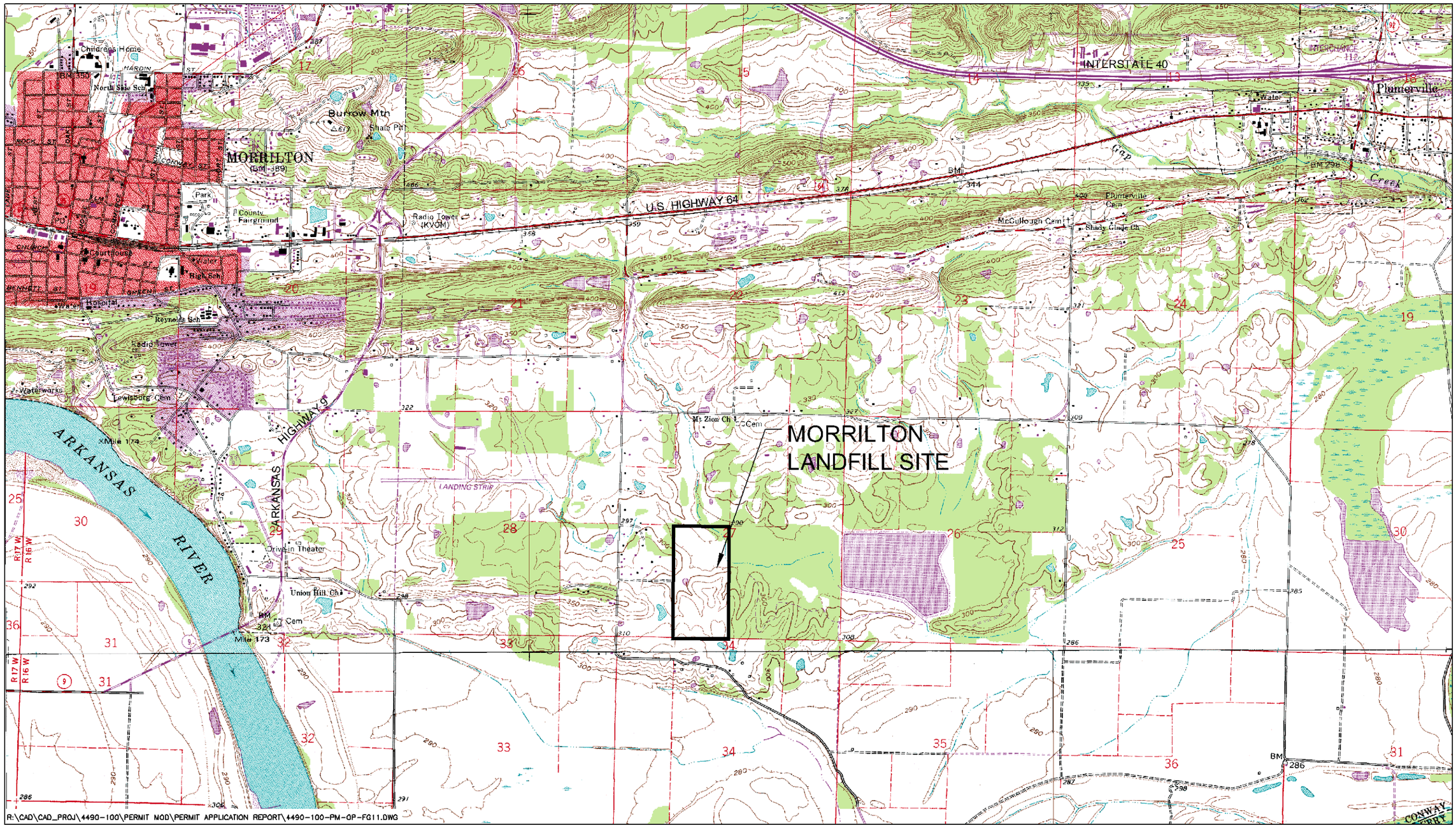
used for Class 1 waste disposal, with the remaining area used for buffer zones and access roads around the perimeter of the waste disposal area, stormwater ponds, and a Class 4 landfill that will be closed when filled to permitted capacity (see Figure 1.2). The Landfill is located in the eastern half of the southwest quarter of Section 27, Township 6 North, Range 16 West, as shown on Figure 1.1. The Landfill is accessed via Arkansas Highway 9, east on County Road 215 to Parette Lake Road, then north to Dump Road and east on Dump Road to the Landfill.

Drainage from the site flows from the stormwater ponds to the city's sanitary sewer system.

The Landfill lies within the Arkansas Valley region of the Interior Highlands. The Arkansas River is located approximately 2 miles west-southwest of the Landfill. Local natural topography consists of about 50 acres of upland terrain and about 20 to 30 acres of low-lying flatland. Elevations at the site range from a low elevation of 287 ft National Geodetic Vertical Datum (NGVD) of 1929 to a high point elevation of 328 ft NGVD.

The Landfill was permitted in June 1991. A copy of the permit (No. 0257-S) is included in Appendix A. The facility's existing permit allowed disposal of Class 1 municipal solid waste and the following "special materials" as outlined in Appendix A of the Arkansas Solid Waste Management Code-March 23, 1984:

1. Friable asbestos material,
2. Condemned alcoholic beverages,
3. Dead animals,
4. Sliced or shredded motor vehicle and farm implement tires, and
5. Spent pesticide and herbicide containers.



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Figure 1.1. Site location map.

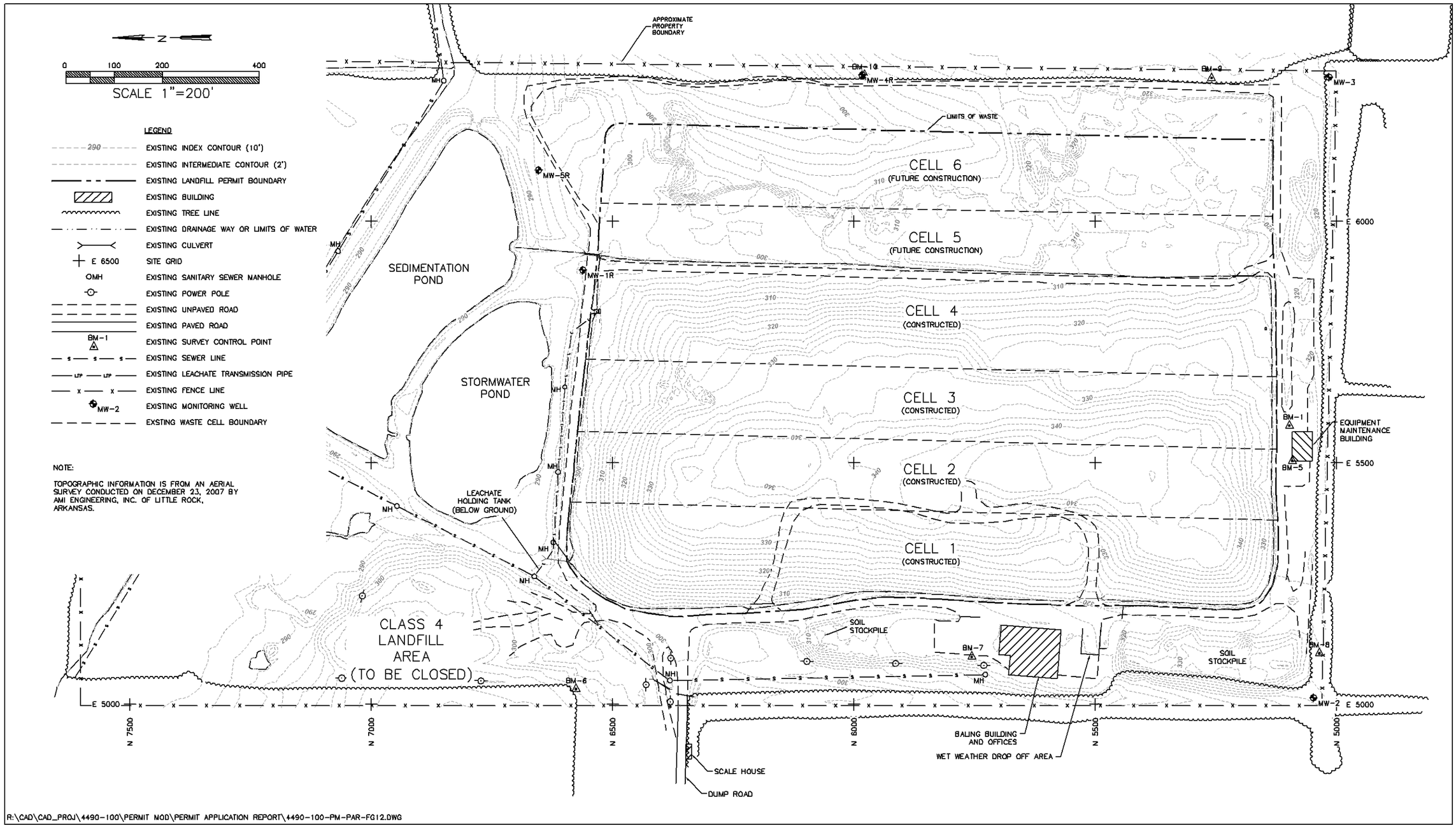


Figure 1.2 Site Map.

To date, approximately 22 acres have been developed for Class 1 waste disposal (Cells 1 through 4). This Permit Modification Application includes a vertical expansion of the Landfill on the existing permitted footprint that increases the permitted capacity of the Landfill from about 1,328,600 cubic yards (cy) to about 2,481,000 cy. The city of Morrilton considers this Permit Modification Application for the Landfill to be a major modification, and public notice criteria will apply, per §22.308(c). As of December 2007, approximately 710,500 cy of waste had been placed in the Landfill.

1.3 Waste Stream Information (§22.303(c)(4))

The Morrilton landfill accepts waste materials generally described as Class 1 and Class 4 materials for disposal. These classifications are described as:

- Class 1 Waste: Nonhazardous household, commercial, and industrial solid waste and small quantities of conditionally-exempt hazardous wastes.
- Class 4 Waste: Nonhazardous, bulky, inert, nonputrescible solid wastes that do not degrade or degrade very slowly. Class 4 wastes include construction and demolition wastes, appliances, furniture, stumps, limbs, and other bulky wastes that are not normally collected with other household, commercial, or industrial waste.

The existing Class 4 waste disposal area at the facility will be closed when it reaches final design capacity (remaining life approximately 23 years as of December 2007). Based on the 2007 Annual Engineering Inspection Report (FTN 2008) , approximately 37,600 tons of Class 1 and 2,600 tons of Class 4 waste are disposed annually at the city of Morrilton facility. Wastes received at the Landfill are primarily from the city of Morrilton with additional wastes from Conway, Van Buren, Perry, and Faulkner counties. The following special materials (§22.303(c)(6)) are proposed for acceptance at the Landfill:

1. Asbestos-containing materials;
2. Food-processing waste;
3. Spent pesticide and herbicide containers; and
4. Petroleum-contaminated soils.

1.4 Approach to Permit Modification

This document provides the regulatory compliance demonstrations as required by Regulation No. 22 for the Permit Modification Application. The completed Arkansas Department of Environmental Quality (ADEQ) permit modification form is included in Appendix B of this document. Information contained in this Permit Modification Application demonstrates that the Landfill, including the proposed modification, is in compliance with Regulation No. 22.

2.0 SITE SELECTION LIMITATIONS AND LOCATION RESTRICTIONS

In accordance with Regulation No. 22, solid waste management facilities are responsible for selecting sites that meet certain location restrictions to help ensure that the facilities do not pose an unreasonable probability of adverse effects on public health or the environment. This section addresses these location restriction standards outlined in Chapter 4 (Class 1 Landfills) of Regulation No. 22 as related to the Landfill. Each subsection of the regulation and the appropriate response that is applicable to the landfill facility is listed below.

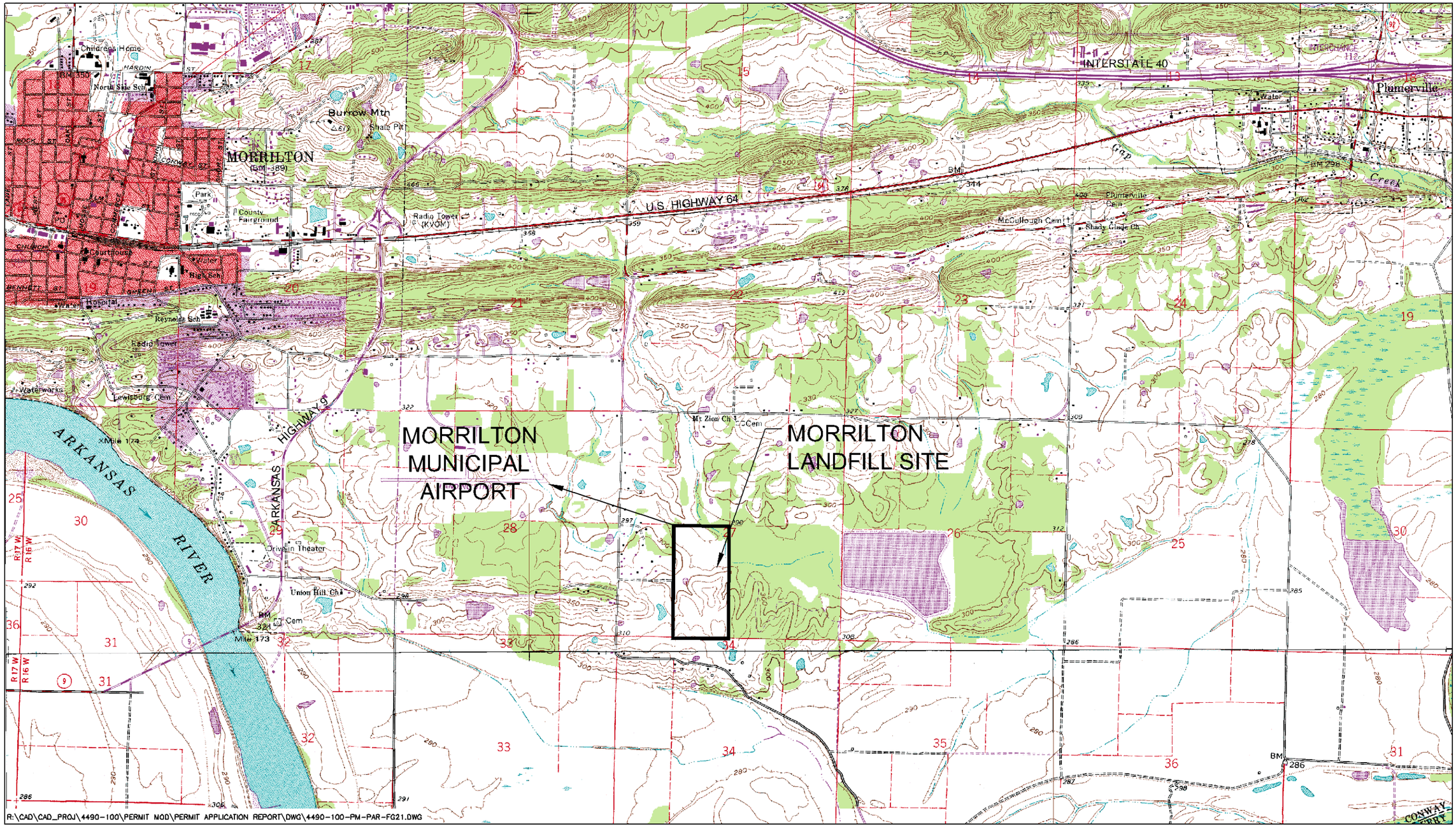
2.1 Airport Safety (§22.402)

This section of the regulation identifies the separation distances between Class 1 solid waste disposal facilities disposing putrescible (biodegradable) wastes and airport facilities, and notification requirements for such disposal facilities.

The existing site is within 10,000 ft of a airport runway end and within 5,000 ft of a airport runway used by only piston-type aircraft, as shown on Figure 2.1. The closest airport runway (Morrilton Airport) is located approximately 3,000 ft northwest of the site. Existing Class 1 landfills that are located within the above distances must demonstrate that the units are designed and operated such that they do not pose a bird hazard to aircraft. This demonstration for the Landfill was prepared in 1993, and applicable correspondence is included in Appendix C.

2.2 Floodplains (§22.403)

This section of the regulation specifies that owners or operators of new Class 1 landfill units, existing units, and lateral expansions located in 100-year floodplains must demonstrate that the unit will not restrict the flow of a base flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste, so as not to pose a hazard to human health and the environment.



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Figure 2.1. Nearest airport.

The landfill site is located outside the boundary of any delineated special flood hazard areas, as indicated on the current (June 3, 1986) Flood Insurance Rate Map (FIRM) for Conway County. The Landfill will be designed and operated such that it will not restrict the flow of the base flood, reduce the temporary water storage capacity of the floodplain, or result in washout of solid waste. The applicable portion of the FIRM is shown as Figure 2.2.

2.3 Wetlands (§22.404)

This section of Regulation No. 22 specifies that new landfills and lateral expansions, and other facilities identified in the regulations, shall not be located in wetlands unless the owner or operator can make the demonstration defined in §22.404 of Regulation No. 22 to the Director of ADEQ.

Because this permit modification is not for a new landfill or lateral expansion, this demonstration is not required.

2.4 Fault Areas (§22.405)

This section of the regulation requires that new Class 1 landfills and lateral expansions not be located within 200 ft (60 meters) of a fault that has had displacement in Holocene time unless the owner demonstrates that an alternative setback distance of less than 200 ft will prevent damage to the structural integrity of the unit and will be protective of human health and the environment.

Because this permit modification is not for a new landfill or lateral expansion, this demonstration is not required.

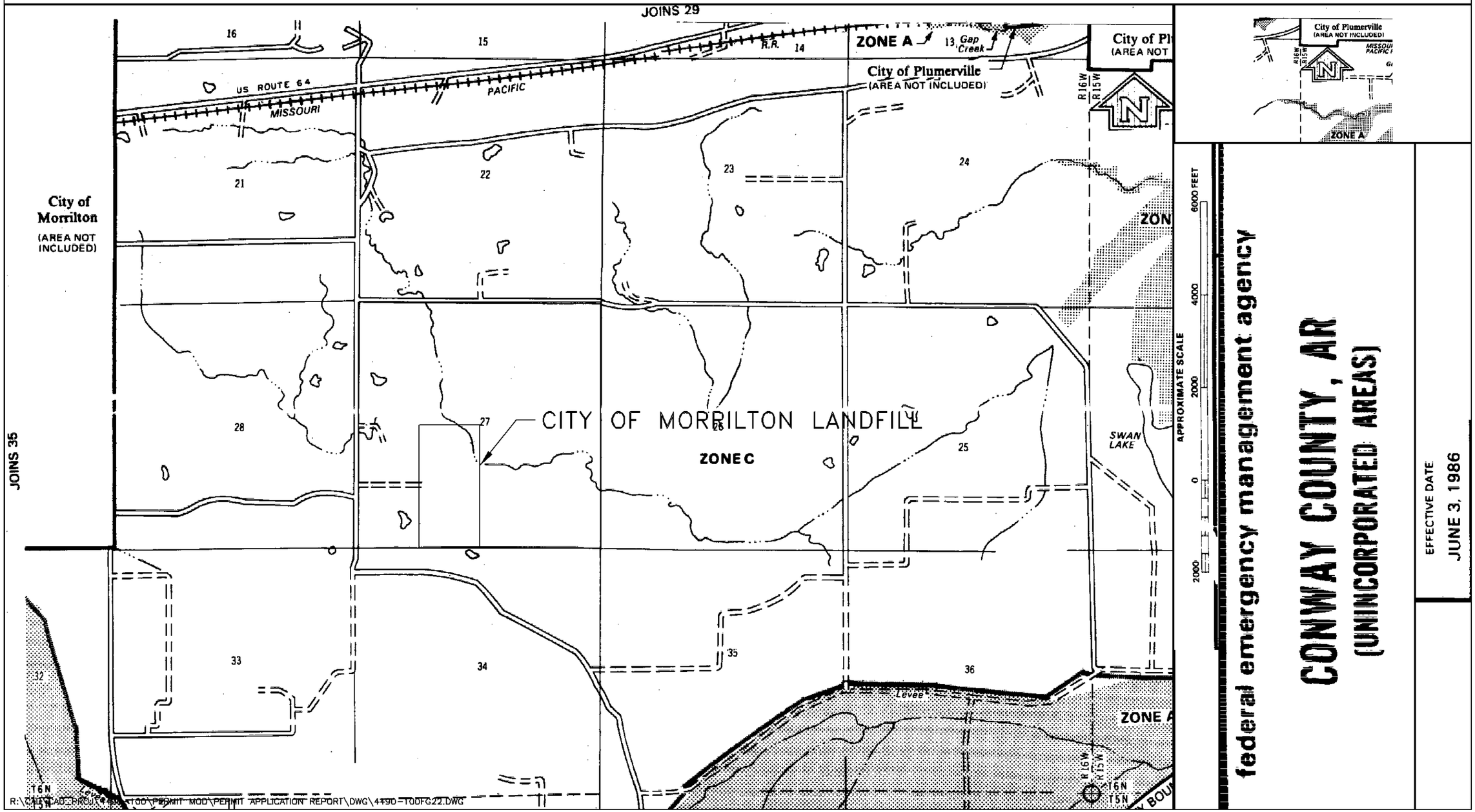


Figure 2.2. Floodplain proximity.

2.5 Seismic Impact Zones (§22.406)

According to this section of the regulation, new Class 1 landfills and lateral expansions to existing facilities shall not be located in seismic impact zones, unless the owner or operator demonstrates to the Director of ADEQ that all containment structures, including liners, leachate collection systems, and surface water control systems, are designed to resist the maximum horizontal acceleration in lithified earth material for the site.

Because this permit modification is not for a new landfill or lateral expansion, this demonstration is not required.

2.6 Unstable Areas (§22.407)

This section of the regulation requires that new Class 1 landfills, existing units, and expansions located in an unstable area must demonstrate that engineering measures have been incorporated into the unit's design to ensure the integrity of the structural components will not be compromised due to differential settling, geologic or geomorphologic features, or human-made features.

A geotechnical and hydrogeological investigation of the landfill area was performed in December 1989. A detailed report prepared by Grubbs, Garner, and Hoskyn, Inc. (Grubbs et al. 1990) describing the investigation and geotechnical testing of soils was included as an appendix to the Permit Application and Operation Methods (June 1990, revised May 1991, ADEQ DIN 28275). According to the results of the geotechnical analyses of the soil samples collected during the subsurface investigation, stable earthen materials underlie the site.

2.7 Separation Distances and Buffer Zones (§22.408)

This section of the regulation outlines the required separation distances and buffer zone widths for new Class 1 landfills and expansions to the permitted area.

Because this permit modification is not for a new landfill or lateral expansion, this section of the regulation is not applicable.

2.8 Endangered Species (§22.410)

This section of the regulation prohibits solid waste facilities and practices from causing or contributing to the taking of any endangered or threatened species of plants, fish, or wildlife. In addition, the facility or solid waste disposal practice shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species as identified in Title 50 Code of Federal Regulations (CFR) Part 17.

The US Fish and Wildlife Service (USFWS) reviewed information regarding the permit modification that was provided by FTN and reported that no federally listed endangered, threatened, or candidate species were present. A copy of the letter from USFWS is included in Appendix C.

The Arkansas Game and Fish Commission no longer responds to notifications of this type because these notifications are handled by USFWS and/or the United States Army Corps of Engineers (USACE).

3.0 OPERATIONAL STANDARDS

Regulation No. 22 contains information for the required minimum operational standards for all classifications of solid waste management facilities. This section of the Permit Modification Application addresses the required operational standards related to the Landfill.

Listed below are the various sections of Chapter 4 (operational standards for Class 1 landfills) of Regulation No. 22 that apply to the Landfill. Responses to each requirement as it relates to the facility follow each listing of the subsection of the regulation.

3.1 General Operating Requirements (§22.411)

3.1.1 Conformance with Permit Documents (§22.411(a))

According to §22.411(a) of Regulation No. 22, all operations at solid waste disposal facilities shall be in accordance with approved plans and the operating plan and narrative.

The city of Morrilton will conduct all operations at the landfill facility in accordance with the Operating Plan for the facility (Appendix E), the facility plans/specifications, the permit conditions, and the applicable requirements of Regulation No. 22. Any permit conditions supersede any stipulation detailed in the narrative, plans, and specifications.

3.1.2 Operator Licensing Requirements (§22.411(b))

This section of the regulation specifies that a licensed onsite operator who has been certified in accordance with APCEC Regulation No. 27 shall perform landfill operations.

A licensed onsite operator will perform operations at the Landfill. The city of Morrilton currently employs nine licensed operators at the Landfill.

3.1.3 Working Face Size (§22.411(c))

This section of the regulation specifies that active working face size shall be confined to the smallest practical area and that multiple working faces are not allowed unless specifically approved in the facility Operating Plan (Appendix E).

The working face will be operated in such a manner to minimize the open area. The average working face will be approximately 100 ft by 100 ft wide. The Operating Plan (Appendix E) provides greater detail on the waste disposal procedures. See Permit Drawing titled Development Plan (Sheet 4) for more details of waste disposal progression.

3.1.4 Waste Spreading and Compacting (§22.411(d))

This section of Regulation No. 22 specifies that, as rapidly as solid waste is unloaded for disposal, it shall be spread and compacted in the smallest practical area and covered in accordance with the requirements of §22.413.

Waste at the facility will be spread and compacted after placement, and daily and interim cover will be placed in accordance with the regulation.

3.1.5 Salvage Operations (§22.411(e))

This section of the regulation specifies that salvage operations may be approved by ADEQ under the following conditions:

1. An area has been designated by the permittee for the recovery of salvageable material;
2. The operations do not interfere with or otherwise delay the activities of the working face;
3. The recovery of salvageable material must be conducted in an orderly manner; and
4. All salvaged materials are removed from the landfill site daily, or properly stored so that they do not create a nuisance or unsightly appearance.

No salvage operations are conducted at the working face.

3.1.6 Prohibited Activities (§22.411(f))

According to this section of the regulations, the following activities are prohibited in conjunction with or upon the site of a permitted landfill:

1. Any scavenging of materials as defined in Regulation No. 22;
2. Any feeding of farm or domestic animals;
3. Depositing waste in standing water; and
4. Open burning as defined in Regulation No. 22.

The Landfill will comply with the requirements set forth in this section of the regulation.

3.1.7 Litter Control (§22.411(g))

This section of the regulation specifies that litter control provisions shall be maintained at all times, and if daily or more frequent cover does not control onsite and offsite litter, other methods may be utilized, including, but not limited to, litter fences and litter crews.

The Landfill employs appropriate methods to control onsite and offsite litter.

3.1.8 Additional Surface Water Controls and Best Management Practices (§22.411(h))

This section of Regulation No. 22 specifies that in conjunction with and in addition to the requirements of §22.418 (Run-On/Runoff Control Systems), §22.419 (Surface Water Requirements), §22.427 (Surface Water Control), and §22.430 (Earthwork Balance), the owner or operator shall:

- Contour the surface of the working portion of the Landfill to minimize surface water run-on or flow into or through the working face;
- Install, construct, repair, and maintain controls to prevent offsite sediment accumulation at all landfill, soil stockpile, and borrow site areas; and
- Ensure that final and interim slope stabilization conforms to §22.427(f).

The surface of the active portions of the Landfill will be graded to minimize surface water run-on into or through the working face. Surface water will be managed during filling operations by contouring of the waste, or constructing temporary diversion ditches and berms. Collected surface waters will be diverted to a perimeter drainage ditch around the Landfill, which drains to the sedimentation pond that is located north of the Landfill (see Sheet 2, Existing Conditions, of the Permit Drawings).

Grading, diking, diversion ditches, silt fencing, silt traps, and other best management practices (BMPs) for stormwater control shall be provided as necessary to control/prevent offsite sediment accumulation from landfill-related operations. In accordance with §22.427(f), exposed slopes will be seeded or stabilized if it is anticipated that these slopes will not be disturbed for more than one growing season. The Operating Plan (Appendix E) describes seeding and soil stabilization methods on both interim and final slopes.

3.1.9 Final Cover Vegetation and Maintenance (§22.411(i))

According to this section of the regulation, after installation of the final cover system for a closed waste cell, a suitable vegetative cover shall be established and maintained to prevent erosion of cover soils.

In order to establish a good stand of vegetation to prevent erosion of the cover soils, the city of Morrilton will seed the final cover (top and side slopes) of the Landfill with a standard native grass mix.

As per the regulation, the vegetation cover will be mowed at least annually or as needed to control the growth of undesirable annual weeds and woody vegetation, and to allow for inspection of the integrity of the landfill cover system.

3.1.10 Equipment Requirements (§22.411(j))

This section of Regulation No. 22 specifies that the operator of a landfill shall have provisions for the routine maintenance of equipment at the landfill and that adequate backup equipment shall be available within 24 hours in the event of breakdowns.

The city of Morrilton maintains the following equipment onsite to perform the required landfill operations:

Table 3.1. Landfill equipment.

Equipment	Typical Quantity
Waste Compactor	1
Dozer	2
Dump Truck	1
Excavator (Track Hoe)	1
Bobcat	1
Forklift	1
1-Ton Pickup	1
Pickup	3

Equipment substitutions and additions may occur during the life of the site. If unexpected situations, such as equipment breakdown or construction of a new waste cell area, require additional or replacement equipment, the city of Morrilton will make arrangements with local dealers or contractors for rental or lease of substitute equipment.

3.1.11 Communications and Emergency Response (§22.411(k))

This section of the regulation specifies that an adequate telephone communication system must be available at the facility in case of fire or other emergency and that a written emergency response plan must be maintained at the site.

Telephones are available at the landfill office. Supervisory personnel at the Landfill are equipped with two-way radios and cellular telephones that can be used in the event of an emergency situation. The procedures for an emergency are outlined in the Emergency Response Plan that has been prepared for the facility. The emergency telephone numbers listed in the following table are posted in the Scale House and in the office/baling building:

Table 3.2. Emergency telephone numbers.

Emergency	Contact Name or Agency	Contact Number
Fire, Hazardous Waste/Unauthorized Waste Spill or Disposal, Accident/Injuries	911	911
	ADEQ Solid Waste Management Division	(501) 682-0600
	Mayor's Office	(501) 354-1556
	ADEQ Field Inspector	(479) 968-7339
	Conway Fire Department District 12 or Morrilton Fire Department	(501) 477-2138 (Conway) or (501) 354-3511 (Morrilton)
Spills into Surface Water	Mayor's Office	(501) 354-1556
	ADEQ Field Inspector	(479) 968-7339
	ADEQ Water Division	(501) 682-0654

3.1.12 Ancillary Facilities (§22.411(l))

This section of the regulation states that the owner or operator must have an onsite building/office with a potable water supply and sanitary facilities for site personnel.

The city of Morrilton has onsite offices located at the Scale House and in the office/baling facility located west of the Landfill (see Sheet 2, Existing Conditions, of the Permit Drawings). Landfill personnel are provided with drinking water and sanitary facilities.

3.1.13 Nuisance Avoidance (§22.411(m))

This section of the regulation states that a landfill facility should be operated in a manner to avoid creating a public nuisance or public health hazard.

To comply with this section of the regulations, the city of Morrilton will execute procedures which include application of daily cover material, litter control, application of final cover material, maintaining stormwater control structures, and general maintenance of the facility.

3.1.14 Cover Maintenance (§22.411(o))

According to this section of the regulation, the integrity of the cover system of a solid waste disposal facility must be maintained at all times.

To comply with this requirement, the city of Morrilton will maintain the cover system integrity and promptly repair erosion, washout, tracking, or other defects in the system that may

expose refuse in either the daily cover or interim cover, or exposure of the barrier system of the final cover. Areas of leachate seepage, or areas exhibiting evidence of leachate seepage such as staining and discoloration, will be promptly repaired as weather allows.

3.1.15 Wet Weather Repairs (§22.411(p))

This section of the regulation states that due care shall be exercised in performing repairs during wet weather conditions to prevent the creation of additional cover defects.

In the event that repairs to the landfill cover system are necessary during wet weather conditions, the city of Morrilton shall exercise extra precaution to prevent the creation of additional cover defects. Temporary measures shall be implemented until permanent repairs can be executed. Installation of landfill cover and establishing permanent vegetative cover on closed waste cells will be scheduled during the summer months to minimize working in the wet weather seasons (fall, winter, and spring).

3.2 Procedures for Excluding the Receipt of Hazardous Waste and Unauthorized Waste (§22.412)

This section of Regulation No. 22 requires that Class 1 landfills implement a program to detect and prevent the disposal of regulated hazardous wastes and polychlorinated biphenyls (PCBs) as defined in APCEC Regulation No. 23, and additional unauthorized wastes.

The city of Morrilton has developed a waste exclusion program designed to prevent the receipt of regulated hazardous wastes, PCB wastes, and other unauthorized wastes at the Landfill. A copy of the facility's Hazardous and Unauthorized Waste Exclusion Plan (§22.412(c)) is included as Appendix F.

Key elements of the program include:

1. Random inspections of incoming loads;
2. Records of inspections;
3. Training of landfill personnel for recognition of regulated hazardous wastes, PCB wastes, and other unauthorized wastes; and
4. Notification procedures.

3.3 Cover Material Requirements (§22.413)

According to this section of the regulation, landfill facilities must cover disposed solid waste with 6 inches of earthen material at the end of each operating day, or at more frequent intervals if necessary, to control disease vectors, fires, odors, blowing litter, and scavenging, and to limit the generation of leachate. A compacted layer of cover soil of sufficient quantity to ensure there is not exposed waste (not less than 12 inches) must be applied to surfaces that will not receive an additional application of waste or final cover within 180 days.

The city of Morrilton will comply with the cover requirements of this section of the regulation. The Landfill may utilize an alternative synthetic cover material for daily cover in conjunction with the soil cover. When using the synthetic cover, anchors will be applied to prevent removal by wind.

3.4 Disease Vector Control (§22.414)

This section of Regulation No. 22 requires that a landfill facility must prevent or control onsite populations of disease vectors using techniques appropriate for the protection of human health and the environment.

The facility will implement procedures to prevent or control onsite populations of disease vectors using techniques appropriate for the protection of human health and the environment.

3.5 Explosive Gases Control (§22.415)

This section of Regulation No. 22 outlines the standards and applicability of explosive gas control systems at solid waste management facilities. According to this section of the regulation, Class 1 landfills are required to:

1. Ensure that the concentration of methane gas generated by the facility does not exceed 25% of the lower explosive limit (LEL) for methane in structures and 100% of the LEL for methane at the facility property boundary;
2. Implement a routine quarterly methane monitoring program to ensure that the above standards are met;
3. Prepare and submit a gas monitoring plan demonstrating how the requirements of this section will be met; and

4. Maintain records in accordance with §22.421 to document compliance with this section.

The city of Morrilton performs quarterly gas monitoring and maintains records in accordance with this section of the regulation. A Gas Monitoring Plan has been prepared and is included as Appendix G.

3.6 Air Criteria (§22.416)

This section of the regulation sets forth clean air requirements for solid waste management facilities. These requirements include:

- Meeting the State Implementation Plan (SIP) approved or promulgated by the Administrator pursuant to Section 110 of the Clean Air Act, as amended;
- Prohibiting open burning of solid waste, unless authorized by ADEQ or allowed by the Arkansas Air Pollution Control Code; and
- Complying with this section through the periodic application of cover material or other techniques as appropriate.

The Landfill is operated in a manner that does not pose a fire hazard to personnel or property. However, in the event that a fire does occur, stockpiles of soil are readily accessible. Dry chemical extinguishers are mounted in each of the city's equipment vehicles. The Morrilton Fire Department will be contacted if needed for assistance in extinguishing a fire. Emergency numbers are posted in the landfill office.

3.7 Access Requirements (§22.417)

This section of the regulation outlines the requirements of access to the landfill facility. These include controlling public access and prevent unauthorized vehicular traffic and illegal dumping of wastes through the use of artificial barriers, natural barriers, or both, as appropriate to protect human health and safety and the environment. All weather operational roads shall be provided for vehicle movement.

Access to the Landfill is restricted by fencing and a gated entrance that can be locked. A sign with the name of the facility, permit number, emergency phone number, and hours of operation is posted on Dump Road. Access to the site is allowed only during the hours when operating personnel are onsite.

The disposal area can be accessed via gravel roads from the asphalt road. The city routinely maintains the gravel access roads to provide adequate access to the working face.

3.8 Run-On/Runoff Control Systems (§22.418)

This section of the regulation states that at a minimum, Class 1 landfills shall design, construct, and maintain:

- A run-on control system to prevent flow onto the active portion of the Landfill during the peak discharge from a 24-hour, 25-year storm; and
- A runoff control system from the active portion of the Landfill to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

In addition, the runoff from the active portion of the Landfill must be handled in accordance with §22.419 and §22.429.

The surface of the active portion of the Landfill will be graded to minimize surface water run-on into or through the active working face. Surface water will be managed during filling operations by constructing temporary diversion ditches and berms. Collected surface waters will be diverted to a perimeter drainage ditch around the Landfill, which drains to the sedimentation pond that is located north of the Landfill (see Sheet 4, Development Plan, of the Permit Drawings). The perimeter ditch system has been designed to adequately carry the peak discharge flow from the landfill area for a 24-hour, 25-year storm event. A copy of the stormwater analysis is included in the Design Report (Appendix D).

3.9 Surface Water Requirements (§22.419)

This section of the regulation specifies that Class 1 facilities shall not:

1. Cause a discharge of pollutants into waters of the US, including wetlands, that violates any requirements of the Clean Water Act (CWA), including, but not limited to, the National Pollutant Discharge Elimination System (NPDES) requirements, pursuant to Section 402 of the CWA;
2. Cause the discharge of a nonpoint source of pollution to waters of the US, including wetlands, that violates any requirement of an area-wide or state-wide water quality management plan that has been approved under Section 208 or Section 319 of the CWA, as amended;
3. Cause a discharge of dredged material or fill material to waters of the US that is in violation of the requirements under Section 404 of the CWA, as amended;
4. Deposit waste in standing water; and shall not
5. Allow the discharge of leachate from the landfill unit unless the discharge is permitted under the NPDES system.

Run-on and runoff control systems will be designed, constructed, and operated as necessary to meet the above requirements. Stormwater discharges from the Landfill are conveyed to onsite sedimentation ponds (see Sheet 2, Existing Conditions, of the Permit Drawings). Discharges from the ponds are conveyed directly to the city's sanitary sewer system.

The erosion and migration potential for materials associated with the Landfill will be managed through implementation of BMPs. BMPs include grading, diking, diversion ditches, silt fencing, silt traps, and the application of a final landfill cover system. Wastes will not be placed in standing water.

3.10 Liquids Restrictions (§22.420)

This section of the regulation outlines restrictions associated with the handling of liquid waste in Class 1 landfills. Bulk or non-containerized liquid waste and containers containing liquid waste shall not be placed in the Landfill unless the waste is household waste other than septic waste, or the waste is leachate or gas condensate derived from the unit and the unit is designed with a composite liner and leachate collection system.

Containers holding liquid waste will not be placed in the Landfill unless the container is similar in size to those normally found in household waste, the container is designed to hold liquids for use other than storage, and the waste is household waste.

Bulk liquid wastes are not accepted at the Landfill and the Landfill does not bulk or mix liquid wastes. Wastes failing a paint filter test will not be accepted for disposal at the Landfill. Because the Landfill does not treat liquid waste, an approved liquid waste management plan for the facility is not required.

3.11 Recordkeeping Requirements (§22.421)

This section of Regulation No. 22 specifies the records to be retained in an operating record maintained at the facility.

The city maintains most of the permanent operating record (POR) for the Landfill at the city administrative offices in Morrilton. However, some records are kept at the landfill facility. The POR contains all records required by this regulation or permit conditions. All information contained in the facility operating record is available for inspection and can be provided to ADEQ upon request. The city of Morrilton will maintain records until the Director authorizes destruction of the records following the completion of the post-closure monitoring period.

The POR includes the following information as required by §22.421:

1. Location restriction demonstrations;
2. Inspection records, training procedures and records, and notification procedures;
3. Gas monitoring results from monitoring and any remediation plans;
4. Any design documentation for placement of leachate or gas condensate;
5. Demonstrations; certifications; findings; and monitoring, testing, or analytical data as required by Chapter 12 of Regulation No. 22;
6. Closure and post-closure plans and any associated testing data related to the plans;
7. Cost estimates and financial assurance documentation required by Chapter 14 of Regulation No. 22;
8. Quality assurance/quality control (QA/QC) documentation, certification, and test results relating to the construction of the landfill liner and leachate collection system, groundwater monitoring system, and final cover system;
9. Permit information, regulations, operator licenses, and operational plans and programs;
10. Leachate disposal records;

11. Analytical results from the testing of special wastes; and
12. Other records required by Regulation No. 22.

The Landfill maintains a "ticket" system as a means of recording the waste that is received by the facility. Landfill scales are in place that weigh all solid waste received at the facility and the scales are maintained and operated in accordance with the US Department of Agriculture standards.

3.12 Operating Plan and Narrative (§22.422)

This section requires that each permitted facility develop and implement an operating plan. The purpose of the operating plan shall be to develop and present site-specific methods and procedures by which the facility will maintain and document compliance.

The Operating Plan is included as Appendix E. The Operating Plan will be updated as required to reflect current operations and regulations. Revisions to the document will be submitted to ADEQ, who reserves the right to require that the changes be accomplished through permit modification prior to implementation.

3.13 Annual Engineering Inspection Reports (§22.423)

This section of the regulation specifies that an Arkansas-registered Professional Engineer shall inspect the landfill site and prepare a report addressing operational compliance with permit conditions, permit plans and specifications, the Operating Plan, and all applicable regulations.

In accordance with this section of Regulation No. 22, the city of Morrilton contracts an Arkansas-registered Professional Engineer to inspect the landfill site at least annually. The engineer prepares a report addressing operational compliance with permit conditions, permit plans and specifications, the facility Operating Plan, and applicable regulations. The report addresses the 12-month period from January through December and is submitted to ADEQ no later than March 31 of the following year. The report contains, at a minimum, the specific requirements as defined in §22.423(b).

4.0 DESIGN CRITERIA

Regulation No. 22 contains information for the required minimum design criteria for all classifications of solid waste management facilities. This section of the Permit Modification Application addresses the required design criteria related to the Landfill.

Listed below are the various sections of Chapter 4 of Regulation No. 22 that relate to design criteria at the Landfill. Responses to each requirement as it relates to the city of Morrilton's facility follow each listing of the subsection of the regulation.

4.1 Minimum Design Criteria (§22.424)

This section of Regulation No. 22 specifies that a new Class 1 landfill or lateral expansion shall be designed to ensure that the maximum contaminant levels of specified constituents not be exceeded in the uppermost aquifer at the relevant point of compliance and include a composite liner and a leachate collection system that is designed and constructed to maintain less than a 12-inch depth of leachate over the liner.

This permit modification is not for a new landfill. The Landfill has been designed to meet the compliance standards of this section of the regulation. The bottom liner of future waste cells is designed as a composite system consisting of a compacted clay liner and a flexible membrane liner (FML). The compacted clay liner will have a maximum hydraulic conductivity of 1×10^{-7} cm/sec and a thickness of 24 inches. The FML component will consist of a minimum 60-mil high-density polyethylene (HDPE) liner placed directly on the compacted clay liner. The bottom liner system is described in detail in the Design Report (Appendix D) and the facility Construction Quality Assurance and Quality Control (CQA/QC) Plan (Appendix H).

The Permit Drawings include the composite liner system as part of the landfill design. A detail of the composite liner system is shown on Sheet 9 of the Permit Drawings.

A leachate collection system has been included in the design of the Landfill. The leachate collection system will be constructed of 12 inches of sand material, or a geocomposite drainage material. The collected leachate is conveyed to the city's sanitary sewer system.

4.2 Survey Control (§22.426)

This section of Regulation No. 22 specifies that a survey control system must be established and maintained at the Landfill as a means of ensuring and documenting that the facility is developed in accordance with the permit drawings. The system must have at least three permanent benchmarks and a grid marker system to aid visual inspection of the progression of the Landfill and other features.

Survey control at the Landfill has been established with permanent horizontal and vertical control markers and a grid system (see Sheet 6, Survey Control Plan, of the Permit Drawings). The system has been developed to ensure and document that the facility is developed according to the Permit Drawings.

The survey control system is based upon a site coordinate system that is based on the State Plane Coordinate System. Landfill grid markers will be established at strategic positions to allow for visual inspection of the progression of the Landfill. Markers will be mounted onto posts and will identify the facility grid position (i.e., E 5000, N 4000). The markers will be installed at the corners of active waste cells to assist in the placement of waste.

The permanent survey control system for the Landfill includes seven control markers located around the landfill boundary (see Sheet 6 of the Permit Drawings). The markers have been installed for site grid reference, and have been located in areas of minimal disturbance. The site grid and survey control points are indicated on the Permit Drawings included with this Permit Modification Application and will be on all future submittals to the Solid Waste Management Division (SWMD) of ADEQ. Prominent landfill features will be located and referenced with respect to the approved site grid.

4.3 Surface Water Control (§22.427)

This section of the regulation specifies that Class 1 landfills must design and implement a system to control surface water at the facility in accordance with the minimum standards set forth in this section.

The stormwater control system was developed based on a hydraulic analysis using the Natural Resources Conservation Service (NRCS) method for computing peak discharge

(SCS 1986). The evaluation was based upon a 24-hour, 25-year storm event for northeast Arkansas. Calculations associated with the hydraulic analysis for the landfill facility (including sizing of stormwater detention ponds) are included in the Design Report (Appendix D).

Stormwater from the Landfill is routed to onsite sedimentation ponds that are located north of the landfill area (see Sheet 2 of the Permit Drawings).

Typical details of erosion-control mechanisms and stormwater control structures for the stormwater control system are included in the Permit Drawings.

4.4 Liner and Final Cover Design and Construction (§22.428)

This section requires that Class 1 solid waste management facilities develop a written QA Plan for liner and final cover systems. A site-specific CQA/QC Plan has been developed for the facility and is included as Appendix H.

4.4.1 Liner System

Future waste cells will be constructed per the design requirements for Class 1 landfills and will typically include a compacted clay liner, at least 24 inches thick, with a hydraulic conductivity of no more than 1×10^{-7} cm/sec and an FML component that consists of a minimum 60-mil HDPE liner. The liner system will be installed in phases in accordance with the CQA/QC Plan. Excavated clayey soils from undeveloped areas will typically be used for the liner construction. The clay material and FML material used in the liner construction will be tested for conformance with the specifications listed in the CQA/QC Plan prior to use in the liner system.

Construction activities of the liner system will include:

1. Preparation of the waste area and stockpiling topsoil or clay material;
2. Preparation of the liner subgrade;
3. Installation and testing of the compacted clay liner in accordance with the facility CQA/QC Plan;
4. Installation of the FML in accordance with facility CQA/QC Plan; and

5. Development of a certification report by an Arkansas-registered Professional Engineer which will include a summary of all construction activities, a description of installed items and materials, an "as-built" plan at a scale of one inch equals 100 ft or less, and a summary statement signed and sealed by the certifying professional.

4.4.2 Final Cover System

The final cover system for the Landfill will meet the requirements of the CQA/QC Plan that is included in Appendix H. The typical cover system that is proposed for the Landfill consists of the following configuration from bottom to top:

- Eighteen inches of compacted clay soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec;
- FML consisting of a minimum 40-mil linear low-density polyethylene (LLDPE) liner;
- A double-sided geocomposite drainage layer; and
- A 12-inch layer of soil vegetated with native perennial grasses.

In lieu of the compacted clay, an alternative cover system utilizing a geosynthetic clay liner (GCL) may be constructed (§22.1301(b)).

The cover system will be installed in phases in accordance with the CQA/QC Plan. As each waste cell is constructed, excavated soils will be placed in designated soil stockpile locations. The cover system for a completed waste area will be constructed in layers. The 18-inch thick barrier layer will be constructed in three loose lifts by placing the excavated or stockpiled soils across the waste material and then compacting to achieve the required permeability of 1×10^{-7} cm/sec and a compacted thickness of 6 inches per lift. After the barrier layer is completed, the FML will be installed. The 12-inch thick erosion layer will be placed over the barrier layer and graded. The erosion layer will be seeded with native grasses.

Cover system installation activities will include:

1. The installation and testing of the barrier layer and FML component of the cover system in accordance with the facility CQA/QC Plan;

2. The installation of an erosion layer;
3. The establishment of the vegetative layer over completed areas; and
4. The development of a certification report by an Arkansas-registered Professional Engineer which will include a summary of all construction activities, a description of installed items and materials used, an "as-built" plan at a scale of 1 inch equals 100 ft or less, and a summary statement signed and sealed by the certifying professional.

Erosion control measures such as hay bale checks, silt fences or erosion control matting will be installed in areas where excessive erosion may occur such as side slopes, discharge locations of stormwater structures, and drainage channels.

4.4.3 Slope Stability Analysis

To determine the overall stability of the proposed final configuration of the Landfill, a slope stability analysis was performed. The GEO-SLOPE International, Ltd. Slope/W 2007 computer program was used to analyze the stability of the landfill slopes. The results of the analysis yielded a minimum "factor of safety" (FS) of 5.4 associated with static conditions, and a FS of 2.8 for dynamic conditions. A description of the analysis, calculations, and figures associated with the stability analysis is included in the Design Report (Appendix D).

4.5 Leachate Collection System Design and Construction (§22.429)

This section of the regulation requires that design and construction of leachate collection systems conform to the requirements of §22.429. Waste Cells 1 through 6 have been designed to include a leachate collection system consisting of a 6-inch diameter perforated HDPE pipe and 12 inches of sand material. This system is designed to maintain a maximum leachate head of less than 12 inches at any point on the bottom liner system. The Design Report (Appendix D) includes calculations and Hydrologic Evaluation of Landfill Performance (HELP) model output that were used to estimate quantities of leachate generation.

The HELP model was run for both open and closed conditions. Based on the proposed design for Cells 5 and 6, the estimated maximum peak daily head on the bottom liner system for the open condition (10 ft of waste) is 12 inches, and the average head is predicted to be

3.5 inches. Based on the proposed final cover system design, the estimated maximum daily head on the bottom liner system for the closed condition is less than 1 inch. Therefore, based on the results of the HELP model, the proposed design of the bottom liner and final cover system perform in accordance with Regulation No. 22.

The leachate collection system for Cells 1 through 3 was constructed with a leachate drainage layer and a perforated drainage collection pipe on the bottom of each cell. The drainage layer consisted of 12 inches of sand and the pipe was a perforated 6-inch diameter HDPE pipe in a bed of gravel. The collected leachate from these three disposal cells is conveyed by gravity flow out of the Landfill.

For Cells 4 (already constructed) through 6, the collection system includes a 12-inch thick drainage layer (sand), a 6-inch diameter HDPE perforated drainage pipe in a bed of washed gravel, and a collection sump. The sump is located in the northern end of each cell and is a depressed area of approximately 50 ft by 50 ft and 2-ft deep. The sump is filled with washed gravel and surrounded by a geotextile fabric. A side-slope riser pipe and pump are used to evacuate the leachate from the sump.

Leachate from Cells 1 through 3 is conveyed via a gravity piping system located north of each disposal area. The leachate flows via a 6-inch diameter polyvinyl chloride (PVC) pipe into a manhole located north of the northern access road. The leachate is then conveyed to an underground storage tank located northwest of the Landfill. The city periodically empties the tank directly into the city's sanitary sewer system.

The leachate transmission system for Cells 4 (already installed) through 6 includes a dual-contained HDPE pipeline that discharges into the manhole north of Cell 3. Each pumping system from Cells 4, 5, and 6 directly discharges into the dual-contained piping.

A certification report for the leachate collection system will be developed by an Arkansas-registered Professional Engineer and will include a summary of all construction activities, a description of installed items and materials, an "as-built" plan at a scale of 1 inch equals 100 ft or less, and a summary statement signed and sealed by the certifying professional.

Representative samples of leachate will be collected and analyzed for groundwater monitoring parameters listed in Appendix 1 of Regulation No. 22 at the same frequency as

groundwater monitoring. The city of Morrilton may request a decrease in the frequency of leachate sampling if historical data indicate little variation in the concentration of detected constituents, as allowed by §22.429(l)(3)(ii).

4.6 Earthwork Balance (§22.430)

This section of the regulation requires a tabulation of excavation and material quantities required to construct the facility as designed.

Based on the design of the Landfill, there will be adequate soil materials for construction of the Landfill. Table 4.1 provides a summary of the estimated quantities of materials.

If borrow material is obtained from a designated source outside of the disposal area for liner or cover construction, daily operations, or any other use, BMPs will be implemented to control erosion at the borrow area. Borrow areas will be reclaimed in accordance with APCEC Regulation No. 15 and the requirements of §22.430(f).

Table 4.1. Estimated earthwork quantities.

Construction Item	Estimated Quantity [1] (cy)
Excavation (Cells 5 and 6)	
Overburden (General Fill)	25,000
Clay Soil	100,000
Total Excavation	**125,000**
Clay Soil	
Compacted Clay Liner (Cells 5 and 6)	32,000
Compacted Barrier Layer (Entire Landfill)	75,000
Total Clay Soil Required	**107,000**
General Fill Soil	
Erosion Layer (Entire Landfill)	50,000
Cover (Daily and Intermediate)	200,000
Berms, roads, etc. (Entire Landfill)	10,000
Total General Fill Soil Required	**260,000**
Total Earthwork	
Excavation	125,000
Fill	377,000
Required Soil [2]	**252,000**

Notes:
1. Quantities based on Permit Drawings (April 2008) and December 2007 topography.
2. Additional soil for clay, cover, and erosion layer will come from city's borrow area immediately southeast of the landfill site.

4.7 Landfill Configuration (§22.431)

This section of Regulation No. 22 requires that:

- Finished grades of the landfill cover be selected to minimize standing water and erosion;
- There is a minimum of 5 ft of separation between the top of the bottom liner system and the seasonally high groundwater elevation, unless approval is obtained for a design that includes maintenance of a positive inward groundwater flow gradient; and
- There is a minimum of 2 ft of separation between bedrock and the top of the bottom liner system.

The side slopes of the completed cells will be graded to 4 (horizontal) to 1 (vertical) (4:1) and the top will be graded to a 5% slope to promote runoff, as shown by Sheet 5. As shown by Sheet 9 of the Permit Drawings, the constructed liner will provide a minimum of 2 ft of separation between bedrock and the top of the bottom liner system. The landfill design will also meet the requirement for a minimum separation distance of 5 ft between the top of the bottom liner system and groundwater, as shown on Sheets 7 and 8 of the Permit Drawings. The groundwater elevations shown on Sheets 7 and 8 reflect the April 2005 water levels, the highest levels measured since 2002 when FTN began monitoring the facility.

4.8 Other Requirements (§22.432)

This section of Regulation No. 22 requires that applicants, permittees, owners and operators comply with applicable provisions of Chapters 11 through 14. These requirements are addressed in Sections 5.0 through 8.0.

5.0 GEOTECHNICAL AND HYDROGEOLOGICAL SUMMARY

Chapter 11 of Regulation No. 22 identifies the regulatory requirements associated with geotechnical and hydrogeological investigations associated with solid waste management facilities. The following sections identify the regulations pertaining to Chapter 11. The associated responses to the regulations with respect to the Landfill follow each subsection listed.

5.1 Class 1 and Class 3 Landfills (§22.1102)

This section of the regulation specifies the requirements for conducting geotechnical and hydrogeological investigations of Class 1 landfills.

Grubbs, Garner, and Hoskyn, Inc. performed a geotechnical and groundwater study in 1989 in association with the current Class 1 landfill permit. The purpose of the study was to thoroughly characterize aspects of the proposed disposal area that could affect design, construction, operation, and monitoring of the Landfill. A detailed report prepared by Grubbs, Garner, and Hoskyn, Inc. described the investigation and geotechnical testing of soils and is included in Appendix I.

The field activities that were completed included:

1. Drilling/sampling of nine lithologic borings,
2. Installing five piezometer/monitoring wells,
3. Measuring water levels,
4. Collecting soil samples for geotechnical classification and testing, and
5. Conducting variable-head tests at two locations to estimate hydraulic conductivity.

Summarized information from the site investigation for the Landfill is as follows:

1. The site is generally underlain by 4 to 20 ft of silty to sandy clay, overlaying a shale formation;
2. Groundwater flow direction is to the northeast, generally reflecting the ground surface expression;

3. Groundwater in the vicinity of the Landfill at the time of the investigation was reportedly of poor quality and undesirable;
4. The uppermost aquifer consists of fractured shale with an estimated hydraulic conductivity of 1.0×10^{-5} cm/sec; and
5. Remolded laboratory permeabilities of the clayey soils to depths of 10 ft at the site range from 1.6×10^{-9} to 1.3×10^{-7} cm/sec.

5.2 Monitoring Well Construction (§22.1103)

This section of Regulation No. 22 specifies the requirements for the construction of groundwater monitoring wells and for installer licensing and supervision.

The current groundwater monitoring system for the Landfill was certified in February 1997 and a description of the system is included in the January 2004 Sampling and Analysis Plan (Appendix I). Monitoring well MW-1R was destroyed during construction of Zone 4 and replaced in July 2006 with approval from ADEQ. The boring log, well construction diagram, and other documentation for the replacement well (MW-1R2) are included in Appendix I.

6.0 GROUNDWATER MONITORING AND CORRECTIVE ACTION

In accordance with §22.1201 of Regulation No. 22, the city of Morrilton has implemented a detection monitoring program to confirm that the groundwater quality standards contained in Appendix 1 of Regulation No. 22, or as otherwise established under Chapter 12, are achieved.

The city of Morrilton has an ADEQ-approved Sampling and Analysis Plan (Appendix I) that describes the groundwater monitoring network that is used to provide representative point-of-compliance groundwater samples. This section summarizes the salient aspects of the Sampling and Analysis Plan.

6.1 Groundwater Monitoring Systems (§22.1202)

The groundwater monitoring network is currently comprised of two upgradient wells and three downgradient wells. Detailed information concerning the monitoring wells is included in the Sampling and Analysis Plan and in the supplemental information that is provided for replacement well MW-1R2 in Appendix I.

6.2 Statistical Method Selection (§22.1203(g))

This section of the regulation requires that the owner or operator specify in the operating record a statistical method to be used in evaluating groundwater monitoring data for each constituent. A description of statistical procedures that will be used for the determination of statistically significant increases (or decreases in pH) is provided in the Sampling and Analysis Plan (Appendix I).

6.3 Sampling and Analysis Plan (§22.1203(j))

The Sampling and Analysis Plan includes the following elements:

1. Detailed procedures used to collect reliable samples from the groundwater monitoring system,
2. Laboratory analytical procedures,

3. Sample collection and laboratory QA/QC procedures,
4. Groundwater analytical data submittal procedures,
5. Method for determining statistically significant changes,
6. Department notification procedures in the event that statistically significant changes are noted, and
7. A contingency plan that outlines the procedures for initiation of an assessment monitoring program if statistically significant increases are detected and confirmed.

6.4 Groundwater Monitoring Reporting (§22.1203(k))

Under the current detection monitoring program, groundwater monitoring reports will be provided semi-annually for the active life of the Landfill and through the post-closure care period, as required by §22.1203(k). Should the facility be placed in assessment monitoring at some point in the future, sampling and reporting would be conducted in accordance with §22.1205. Reports will be prepared and certified by a qualified groundwater scientist and include the elements described in this section of the regulation.

6.5 Groundwater Monitoring Parameters (§22.1204(a)(3))

This section of the regulation allows ADEQ to modify the list of detection monitoring parameters for Class 1 facilities, if the applicant can demonstrate that a particular constituent, or its reaction products, cannot be present within the waste to be placed in the Landfill. This section of the regulation also states that other parameters of concern may be added by ADEQ based on individual waste and leachate characteristics.

The Sampling and Analysis Plan for the facility includes the ADEQ-approved detection monitoring parameters for the facility (Appendix I). The detection monitoring parameter list is shown by Table 6.1.

6.6 Sampling Frequency (§22.1204(b))

Groundwater sampling has been routinely conducted at the site since 1994. Groundwater sampling will be continued on a semi-annual basis, unless the facility is placed in assessment monitoring at some point in the future. Assessment monitoring would be conducted in accordance with §22.1205.

Table 6.1. List of analytical parameters for detection monitoring.

Organic Parameters	Inorganic Parameters
Acetone	Arsenic
Acrylonitrile	Barium
Benzene	Beryllium
Bromochloromethane	Chromium
Bromodichloromethane	Cobalt
Bromoform	Copper
Carbon Disulfide	Lead
Carbon Tetrachloride	Nickel
Chlorobenzene	Vanadium
Chloroethane	Zinc
Chloroform	Chloride
Dibromochloromethane	Total Dissolved Solids
DBCP	Sulfate
EDB	Total Organic Carbon
1,2-Dichlorobenzene	Iron
1,4-Dichlorobenzene	Manganese
trans-1,4-Dichloro-2-Butene	pH*
1,1-Dichloroethane	Conductance*
1,2 Dichloroethane	Turbidity*
1,1 Dichloroethylene	Temperature*
cis-1,2-Dichloroethylene	
trans-1,2-Dichloroethylene	
1,2-Dichloropropane	
cis-1,3-Dichloropropene	
trans-1,3-Dichloropropene	
Ethylbenzene	
2-Hexanone	
Methyl Bromide	
Methyl Chloride	
Methylene Bromide	
Methylene Chloride	
Methyl Ethyl Ketone	
Methyl Iodide	
4-Methyl-2-Pentanone	
Styrene	
1,1,1,2-Tetrachloroethane	
1,1,2,2-Tetrachloroethane	
Tetrachloroethylene	
Toluene	
1,1,1-Trichloroethane	
1,1,2-Trichloroethane	
Trichloroethylene	
Trichlorofluormethane	
1,2,3-Trichloropropane	
Vinyl Acetate	
Vinyl Chloride	
Xylene	

*Field Parameter

7.0 CLOSURE AND POST-CLOSURE CARE PLAN

7.1 Closure Criteria (§22.1301)

This section of the regulations specifies the design requirements for landfill cover systems and the procedures for closing solid waste management facilities. These requirements include:

1. Minimum final cover system design;
2. Alternative final cover system design;
3. Closure plans;
4. Notification of closed landfill or completed units;
5. Schedule for closure operations;
6. Grading;
7. Site survey;
8. Land use restriction; and
9. Certification of closure.

7.1.1 Landfill Cover Design (§22.1301(a))

According to this section of the regulations, Class 1 landfill units in operation after May 7, 1995, must install a final cover system that is designed with an erosion layer underlain by an infiltration layer, as follows:

- The infiltration layer must be comprised of a minimum of 18 inches of earthen material that has a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than 1×10^{-5} cm/sec, whichever is less. A flexible membrane liner must be incorporated into the final cover design where the bottom liner design includes a composite liner; and
- The erosion layer must consist of a minimum 6 inches of earthen material that is capable of supporting native plant growth.

In lieu of the compacted clay, an alternative cover system utilizing a GCL may be constructed (§22.1301(b)).

To date, final cover has not been installed on any areas of the active landfill. The final cover system for the Landfill will meet the requirements of the CQA/QC Plan that is included in

Appendix H. As shown on the attached Permit Drawings (Sheet 9) and described in the Closure and Post-Closure Plan presented in Appendix J, the typical final cover system that is proposed for the Landfill includes (from bottom to top):

- Eighteen inches of compacted clay soil with a hydraulic conductivity of no more than 1×10^{-7} cm/sec;
- An FML consisting of a minimum 40-mil LLDPE liner;
- A double-sided geocomposite drainage layer; and
- A 12-inch layer of soil vegetated with native perennial grasses.

In lieu of the compacted clay, an alternative cover system utilizing a GCL may be constructed (§22.1301(b)).

The 12-inch erosion layer will not be compacted. Installation of the cover system will typically be performed during the summer months to minimize wet weather problems. Prior to installation of the cover system on a completed waste cell, the landfill cell will be graded to prevent stormwater from running into the cell and to ensure that depressions do not exist in the landfill unit. Erosion control measures will be used as necessary to protect the final cover and prevent offsite sedimentation.

7.1.2 Closure Plans (§22.1301(c))

The Closure and Post-Closure Care Plan for the facility is included in Appendix J. Various aspects of facility closure (§22.1301(d) through §22.1301(1)) are described in detail in the plan. When the Landfill stops receiving wastes for disposal, notification will be sent to the SWMD of ADEQ stating that a notice of the owner's intent to close the landfill unit has been placed in the POR. Closure of the Landfill will begin no later than 30 days after the date on which the unit receives the known final receipt of wastes. Completion of closure activities for the Landfill, in accordance with the closure plan, will occur within 180 days following the beginning of closure procedures. Once the closure process is complete, a registered professional surveyor or an Arkansas-registered Professional Engineer will survey the site and document the final elevations of the Landfill and the location of other permanent features.

Following the placement and certification of the final cover over the entire landfill, the city of Morrilton will record a notation on the deed to the landfill facility property or some other instrument that is normally examined during a title search. The notation on the deed will in perpetuity notify any potential owner of the following:

1. The past use of the land as a landfill facility;
2. Future land uses shall comply with APCEC regulations and shall not disturb the integrity of the final cover system, the liner system, or any other components of the containment or monitoring system;
3. It shall be unlawful for any person, partnership, company, corporation, or other entity to build, erect, or construct any house, home, or building to be used for residential purposes (this restriction shall apply to the area used for the actual disposal of solid waste);
4. The land has been used for the disposal of asbestos-containing waste material (ACM); and
5. The survey plot and record of the location and quantity of ACM disposed within the disposal site as required by APCEC Regulation No. 21 have been filed with ADEQ.

A certified copy of the document will be obtained from the clerk or court and be filed with the SWMD of ADEQ, and a copy will be placed in the facility POR. The Director of ADEQ will be notified that the notation has been recorded and a copy has been placed in the POR.

The closure activities will be monitored by an Arkansas-registered Professional Engineer to ensure that closure has proceeded according to the approved closure plan. Following closure of the landfill facility, a final written certification, signed by an Arkansas-registered Professional Engineer verifying that closure was completed in accordance with the approved closure plan, will be submitted to the SWMD. The certification will be placed in the facility operating record. The following information will accompany the certification:

1. The final survey in accordance with §22.1301(i);
2. QA/QC data documenting proper construction and installation of the cover system;
3. A copy of the land restriction deed required by §22.1301(j); and

4. Other information that the SWMD may deem necessary to making the certification.

7.2 Post-Closure Care Requirements (§22.1302)

This section of the regulation defines the post-closure care requirements for solid waste management facilities. It includes post-closure care time limits, post-closure care plan requirements, notification procedures, and allowances for phasing of closure and post-closure care.

A Closure and Post-Closure Care Plan has been developed for the Landfill. A copy of the plan, located in Appendix J, will be placed in the facility POR after approval by the SWMD.

The post-closure care period will terminate 30 years following the date of written confirmation by the SWMD that the site has been closed in accordance with the approved closure plan, unless the period has been increased or decreased by the Director of ADEQ as allowed by §22.1302(c)(4).

The name, address and telephone number of the person or office to contact concerning the landfill facility during the post-closure care period will be provided upon notice of closure. Presently, the anticipated post-closure use of the landfill area is open space. However, the actual long-term use of the facility will be evaluated at the time of closure. The final cover of the Landfill will not be disturbed without the approval of the SWMD (§22.1302(h)).

Following completion of the post-closure care period for the Landfill, the city of Morrilton will notify the SWMD that a certification, signed by an Arkansas-registered Professional Engineer, has been prepared and placed in the facility POR. The certification will verify that the post-closure care has been completed in accordance with the facility's Closure and Post-Closure Care Plan.

8.0 FINANCIAL ASSURANCE CRITERIA

8.1 Applicability and Effective Date (§22.1401)

This section of the regulation states that owners and operators of permitted Class 1, Class 3, and Class 4 landfills shall meet the requirements for financial assurance for solid waste management facilities outlined in §22.1402 through §22.1406.

The city of Morrilton, as owner of the Landfill, will maintain financial assurance for closure and post-closure care, in accordance with §22.1405.

8.2 Financial Assurance for Closure (§22.1402)

The section of the regulation specifies the requirements for establishing and demonstrating financial assurance for solid waste management facilities.

The current estimated costs of closure and post-closure of the facility are included in the Closure and Post-Closure Care Plan (Appendix J). The estimates are based on the cost of hiring of a third party to close the largest area ever requiring a final cover at any time during the active life. The estimated closure and post-closure cost will be adjusted for inflation annually during the active life of the facility. If the maximum closure and post-closure care costs increase during the active life of the facility, then the amount of financial assurance provided and the closure cost estimate will be increased. If the cost estimate exceeds the maximum cost of closure at any time during the remaining life of the permitted facility, then the closure cost estimate and financial assurance may be reduced (with ADEQ approval).

The city of Morrilton has filed the appropriate documentation for demonstration of financial assurance for the Landfill. The financial assurance for the facility will be adjusted, as necessary, upon approval of this Permit Modification Application.

9.0 SELECTED REFERENCES

FTN. 2008. 2007 Annual Engineering Inspection Report, City of Morrilton Class 1 and Class 4 Landfills. Little Rock, AR.

SCS. 1986. Technical Release Number 55, Rational Method. United States Department of Agriculture.