

US EPA ARCHIVE DOCUMENT

## **EXECUTIVE SUMMARY**

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### **Introduction**

Clinton Landfill, Inc. (CLI) owns and operates the Clinton Landfill No. 3, located in DeWitt County, Illinois. The Clinton Landfill No. 3 received a development permit from the Illinois Environmental Agency (IEPA) to develop an approximate 157.50 acre Municipal Solid Waste (MSW) landfill in March 2007 (Permit No. 2005-070-LF).

Pursuant to Section 6(e)(1) of the Toxic Substances Control Act (TSCA) of 1976, Public Law No. 94-469, 15 U.S.C. Section 2605(e)(1), and the federal PCB regulations promulgated thereunder (40 CFR Section 761.75), CLI has prepared the following Application to request approval to modify the design, Construction Quality Assurance (CQA) Plan, Operating Plan, Environmental Monitoring Plan, and other portions of the permitted Clinton Landfill No. 3 to include a Chemical Waste Unit. The reason for this request is to permit the safe acceptance of non-hazardous wastes, including PCB wastes that contain total PCB concentrations no greater than 500 ppm. The proposed Chemical Waste Unit would occupy approximately 22.50 acres of the currently permitted waste disposal area.

The design provided within this application includes the latest landfill design concepts which have been demonstrated to be protective of the environment. Unique to the proposed facility are the number and extent of safeguards employed. In many cases, the stringent design and performance standards contained in state and federal landfill regulations have been exceeded. Additionally, the proposed design works in conjunction with a suitable location and favorable site geology to assure that the public health, safety and welfare will be protected.

### **Location (Section 1)**

The permitted Clinton Landfill No. 3 complies with all applicable federal, state and local site location standards. The proposed Chemical Waste Unit is located within the permitted waste boundary of the IEPA approved landfill and therefore will be in compliance with all applicable federal, state and local site location standards.

### **Hydrogeology (Section 2)**

A succession of low-permeability cohesive soil units (Tiskilwa Formation, Roxana/Robein Silt, Berry Clay, Radnor Till, Vandalia Till, Smithboro Till, Yarmouth Soil, Tilton Till, and Hillary Till) are present beneath the site which will separate the footprint of the proposed Chemical Waste Unit from the regional aquifer. These low permeability cohesive soil units have an average thickness of approximately 200 feet at the site (approximately 170 feet of which will remain between the bottom of the proposed liner invert and the regional Mahomet Sand Aquifer). Field and laboratory test results and field observations indicate that these materials will effectively restrict vertical and horizontal movement of groundwater and will serve as an additional environmental safeguard beneath the proposed Chemical Waste Unit.

The natural clay that is present beneath the site will act as a Tertiary barrier in addition to the proposed robust engineered liner system which is described in detail within Section 3 of this Application.

The hydrogeologic conditions at the site and the landfill design allow a comprehensive groundwater monitoring system to be implemented which will be able to adequately verify, in advance, if groundwater resources are being threatened by the landfill.



### Engineered Design (Section 3)

A number of engineered design features have been incorporated into the proposed Chemical Waste Unit in order to safely contain the waste materials placed in it. These containment systems are briefly summarized below:

Composite Liner. The proposed Chemical Waste Unit includes a multiple layer composite liner system. From the subgrade up across the entire unit, the liner will, at a minimum, consist of 3 feet of recompacted clay ( $1 \times 10^{-7}$  cm/sec), a 60-mil geomembrane, a geocomposite drainage layer, a second 60-mil geomembrane. In addition, CLI has added a geosynthetic clay liner (GCL), and a third 60-mil HDPE geomembrane above the floor and lower portions of the landfill sidewalls. This liner system greatly exceeds the requirements of the United States Environmental Protection Agency (USEPA) and has been accepted by the Illinois IEPA and other experts in the landfill field as providing a high level of environmental safety. The multiple layer composite liner system will effectively prevent the release of potential hazards from the Chemical Waste Unit.

Leachate Collection. A leachate drainage/collection system will be constructed on the bottom of the landfill to quickly remove leachate from the landfill. The primary leachate drainage/collection system includes a highly permeable drainage layer (land on the floor and geonet on the sidewalls) to transmit leachate to a series of high-strength plastic pipes placed at intervals on the bottom liner. The permeability of the leachate drainage material is 30 times greater than applicable requirements thereby effectively minimizing the hydraulic head on the liner system. In addition, a redundant leachate drainage/collection system has also been included within the proposed liner system design directly beneath the primary liner system in order to provide additional leachate removal capabilities if necessary. The primary and redundant leachate drainage/collection systems will rapidly transmit leachate to collection sumps from which the leachate will be extracted from the landfill using automatically controlled pumps.

Final Cover. Upon the Chemical Waste Unit being filled to its intended height, it will be overlain by Municipal Solid Waste to achieve the final proposed grades and a final cover system will be constructed to cap the waste. The primary purpose of the final cover is to prevent rainwater from entering the landfill and coming into contact with waste and producing leachate. The final cover system that will cap the landfill consists of a low-permeability layer to prevent precipitation from entering the landfill, a subsurface drainage layer to ensure final cover stability and virtually eliminate hydraulic head on the low permeability layer, and a protective soil layer to prevent erosion and maintain the long-term integrity of the cap.

The low-permeability layer will include a 40-mil HDPE geomembrane (double-sided textured on slopes greater than 5H:1V) and a one foot thick compacted cohesive soil layer with a maximum permeability of  $1 \times 10^{-7}$  cm/sec. A geocomposite drainage layer will overlay the geomembrane to drain precipitation away from the low-permeability layer. The protective soil layer will be placed over the geocomposite and will include a minimum of three (3) feet of protective soil, with the upper six (6) inches being a vegetative layer. To facilitate drainage and minimize erosion, the slope of the final cover will be a maximum of 4H:1V and a minimum of 5 percent. The final slopes of the landfill will be vegetated and will incorporate drainage terraces to effectively control erosion.

Groundwater Impact Assessment (GIA). Extensive contaminant transport computer modeling was performed for the permitted landfill that was approved by the IEPA. The results of the computer model demonstrate that this site is protective of the public health, welfare, and



safety due to the excellent hydrogeologic characteristics of the site used in combination with the landfill liner design.

The GIA included many conservative assumptions in the analysis 10.7 feet of leachate head on the liner, and flaws (i.e. holes) in the geomembrane. Furthermore, a single-composite liner system was modeled. The proposed multiple-layer composite liner and leachate drainage/collection system will be even more protective as it will virtually eliminate any hydraulic head on, and thus impingement into, the liner system.

#### **Stormwater Management (Section 4)**

A stormwater management system has been permitted for the Clinton Landfill No. 3 and will be constructed to control and manage precipitation that falls onto the landfill. This system has been updated and calculations have been revised to include the proposed Chemical Waste Unit. The purpose of this system is to: protect the final cover against erosion; to divert rainwater away from waste materials in the active landfill areas; eliminate the potential for flooding; and to improve the water quality conditions of the site. All ditches and basins are adequately sized.

The stormwater management system includes:

- ☐ Perimeter ditches around the landfill to collect storm runoff,
- ☐ Interim ditches to collect storm runoff from the Chemical Waste Unit intermediate slope prior to filling of the separation area with Municipal Solid Waste,
- ☐ Detention basins to detain and control the release of the 100-year, 24-hour flood event which exceeds the state regulations to control the 25-year, 24-hour flood event, to facilitate sedimentation, and to improve water quality,
- ☐ A stage outlet structure with a restrictor to reduce the discharge rate to adjacent watersheds,
- ☐ A valved outlet structure that will only be opened once the detained stormwater has been cleared of sediment, and
- ☐ Terrace berming on the final landform slopes to reduce the potential for erosion.

#### **Construction Quality Assurance Program (Section 5)**

The purpose of the Construction Quality Assurance (CQA) program is to assure that landfill design features (such as the composite liner) are constructed as specified. The CQA program includes oversight during construction, testing of construction materials, and documentation of all inspection and testing activities. A third-party licensed professional engineer must certify that the constructed features at the landfill meet or exceed design standards. The CQA Plan is provided in Section 5.



## **Operating Plan (Section 6)**

The purpose of the Operating Plan is to assure that the proper procedures are followed for waste disposal operations at the proposed Chemical Waste Unit, and for maintenance and monitoring of the engineered systems at the facility. The proposed Chemical Waste Unit would not except waste with total PCB concentrations greater than 500 ppm. Detailed testing of the proposed waste will occur prior to waste acceptance. Training and safety procedures will continue to be employed to make the landfill a safe workplace for employees and the community. Contingency plans exist at the site in order to halt or modify landfill operations in the event of natural disasters or other emergencies.

## **Environmental Monitoring (Section 7)**

A comprehensive environmental monitoring program has been designed for the proposed Clinton Landfill No. 3 Chemical Waste Unit to serve as an additional safeguard in order to:

1. Monitor groundwater, surface water, and ambient air quality at the facility,
2. Verify that the landfill design is functioning as intended, and
3. Provide an early warning system in the unlikely event of a release.

The environmental monitoring program consists of the following systems: (1) groundwater monitoring, (2) leachate monitoring, (3) surface water monitoring, and (4) ambient air monitoring.

All monitoring will follow strict quality control, quality assurance and chain of custody procedures. This environmental monitoring program will verify that the facility design and construction are properly functioning to protect the public health, safety and welfare.

## **Closure and Post-Closure Care Plan (Section 8)**

A Closure and Post-Closure Care Plan has been developed for the proposed Clinton Landfill No. 3 Chemical Waste Unit. The closure and post-closure care plan provides a list of steps that Clinton Landfill, Inc. will perform to ensure proper closure of the facility along with providing continued maintenance of the facility during the post-closure care period. A cost estimate was prepared utilizing conservative third party costs to ensure that proper funding is provided during the operating and closure periods of the unit.

Post-Closure Care of the Chemical Waste Unit will continue perpetually. Financial assurance will be provided to the USEPA prior to waste acceptance in the proposed Chemical Waste Unit. The amount of financial assurance will total the costs required to complete all remaining closure activities, and to properly monitor and maintain the facility for 30 years following closure. Following closure, financial assurance will be perpetually maintained to provide post-closure care for a 30 year period. The Closure and Post-Closure Care Plan is provided in Section 8.



## **Conclusion**

This Application proposes a modern design that utilizes multiple back-up systems, an Operating Plan, an Environmental Monitoring Plan, and a Closure/Post-Closure Care Plan to properly manage TSCA-regulated PCB wastes with total PCB concentrations no greater than 500 ppm. The new Chemical Waste Unit would be located within the permitted boundaries of the previously permitted Clinton Landfill No. 3. The proposed Chemical Waste Unit would occupy approximately 22.50 acres of the currently permitted facility.

In addition to conforming with all applicable regulations, the modified design provided within this application includes the latest landfill design concepts with multiple redundant systems that has been demonstrated to be effective at other facilities and shown to be protective of the environment. Unique to the proposed facility, however, is the number and extent of safeguards employed. In many cases, the stringent design and performance standards contained in state and federal landfill regulations have been exceeded. Additionally, the facility design works in conjunction with a suitable location and favorable site geology to assure that the public health, safety and welfare will be protected.

