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March 2, 2009

Attention: LR-8J
Mr. Willie H. Harris, P.E.
Chief, RCRA Branch
Land and Chemicals Division
U. S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3590

Subject: LR-8J
Clinton Landfill #3
Clinton, Illinois
Response to Preliminary Notice of Deficiency and Subsequent Supplemental Letter

Dear Mr. Harris:

On behalf of Clinton Landfill, Inc. (CLI), Shaw Environmental, Inc. (Shaw) is submitting this response to the preliminary notice of deficiency and the subsequent supplemental letter sent by the United States Environmental Protection Agency (USEPA).

The following information responds to each of the comments identified by the USEPA in the preliminary notice of deficiency letter received on August 21, 2008 and the subsequent supplemental letter received on January 6, 2009. This submittal consists of this letter response and respective figures and attachments. An original paper copy and electronic copy of this submittal are being submitted.

RESPONSE TO COMMENTS

The following provides the USEPA comments (in italic) and the respective Applicant response.

August 21, 2008 Comments

1) *The scope of the subsurface investigations included in the TSCA application and the groundwater impact assessment is limited. We request an investigation with a broader scope but including specific targets. The investigation and modeling must specifically focus on the Mahomet Aquifer and nearby municipal water well fields and explain the impact of the entire landfill on them in ways the public can understand.*

   Applicant's Response: A broader investigation has been performed which focused on the Mahomet Aquifer and the nearby community water supply wells. The following responses are supported by figures which simplify the hydrogeologic setting that resides below the facility and answer the comments raised by the USEPA in a manner that will be more readily understood by the general public.

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2) *Review of existing conditions and development of hydrogeological forecasts over the entire Clinton Water Resource Protection Zone or within a 10-15 mile radius of the landfill will help increase the level of effectiveness of the investigations and address our issues.*

Applicant's Response: An investigation into all community water supply wells within 15 miles of the facility has been performed. Figure 1 shows all active community water supply wells within a 15-mile radius of the facility. A community water supply well has been defined by the Illinois State Water Survey (ISWS) as "a public water system which serves at least 15 service connections used by residents or regularly serves at least 25 residents for at least 60 days per year". Only community water supply wells classified as active in the currently available ISWS database (2003) are shown on Figure 1. The map was used as a starting point for the rest of the investigation into the location of the community water supply wells. The investigation procedures discussed below include the map and other databases/sources which provided a current and thorough review of all of the community water supply wells.

The following databases/sources were contacted to locate potential community water supply wells within 15 miles of the facility:

- ISWS Illinois Community Water Supply Wells Map,
- Safe Drinking Water Information System (SDWIS),
- Illinois State Geological Survey (ISGS) interactive water well database, and
- Direct calls to the communities identified in this investigation (if necessary to identify wells and their respective information).

A summary table (Table 1) of the active community water supply wells has been developed and is provided in Attachment 1. Table 1 lists the relevant information for each respective well. Additionally, the SDWIS information and actual well logs (if available) for each community water supply well(s) follow Table 1. While Table 1 provides information for active wells only, the inactive wells have also been provided (if available) in the information following Table 1.

Table 1 indicates that about half of the community water supply wells within 15 miles of the facility withdraw their water from the Mahomet Aquifer. The rest of the community water supply wells withdraw their water from the discontinuous silt and sand lenses located within the regional glacial clay tills. As already indicated by the USEPA and supported by this community water supply well investigation, the Mahomet Aquifer is the major aquifer in the vicinity of the facility. As shown on Figure 1, regional groundwater flow is to the northwest in the Mahomet Aquifer.

Poly-chlorinated bi-phenyl (PCB) waste properties, the chemical waste unit (CWU) design, and hydrogeological setting were assessed so concerns regarding potential contamination of the Mahomet Aquifer by site activities could be addressed and clarified. The results of the assessment are summarized in the following paragraphs.

In order to properly understand the safeguards which the CWU will provide, it is important to review some basic facts about PCBs. Firstly, it is a widely recognized fact that PCBs are non-volatile, virtually insoluble, and have very low mobility in the environment. These properties are problematic where PCBs were historically discharged to rivers and streams. Whereas soluble and mobile contaminants that were historically discharged and dispersed throughout the waterways, the insoluble PCBs accumulated in, and bound to, the bottom sediments where they remained exposed and accessible to the aquatic life food chain. This eventually allowed fish used for human consumption to bioaccumulate unhealthy concentrations of PCBs. While these conditions result in an environmental hazard in uncontrolled settings, they do not occur in a properly sited, designed, and operated landfill such as the CWU. In fact, the very properties that result in PCB hazards in an uncontrolled environment make landfilling PCBs very secure. Once buried in a landfill, the PCBs will be isolated from any direct contact with living organisms. Furthermore, the non-volatility of the PCBs will prevent their release to the atmosphere, and their insolubility will prevent their migration to groundwater. As a result of these factors, the Mahomet Aquifer will never be impacted by the CWU.

The following paragraphs provide more details substantiating how the CWU will protect local and regional groundwater resources (including the Mahomet Aquifer) below the site:

- Leachate data from two USEPA-permitted chemical waste landfills that accept PCB waste were acquired via the Freedom of Information Act (FOIA). These two facilities, Wayne Disposal, Inc. (WDI) landfill located in Michigan (USEPA Region 5) and Clean Harbors Grassy Mountain facility located in Utah (USEPA Region 8), are also permitted as Resource Conservation and Recovery Act (RCRA) Subtitle C landfills. The leachate data from these facilities were reviewed and summarized. The WDI facility leachate data (monthly data from 2005 to 2007) indicated that PCBs were detected in only 7 of 231 samples analyzed for PCBs. The highest concentration of PCBs detected was 0.0056 parts per billion (ppb). The Grassy Mountain facility leachate data (semi-annual from 2001-2007) indicated that PCBs were detected in only 2 of 1,575 samples analyzed for PCBs. The highest concentration of PCBs detected at the Grassy Mountain facility was 0.00148 ppm. The lack of PCB detections and low reported concentrations (when detected within the leachate) are due to the immobile nature of PCB wastes. It should be noted that the WDI and Clean Harbors Grassy Mountain facilities are allowed to dispose PCB wastes exhibiting concentrations greater than 500 ppm. However, CLI has agreed to not accept PCB wastes at concentrations greater than 500 ppm. Based on this agreement, one would expect the PCB concentrations in the leachate at the proposed CWU to be even less than the minimal detections discussed above.

- All water that contacts waste (leachate) will be collected and properly treated to EPA standards prior to discharge. Any leachate that collects in the bottom of the landfill will be pumped out and stored in a dual contained storage tank before being managed in accordance with the Application.

- Although not specifically required by the Chemical Waste Landfill regulations, CLI will install a multiple layer composite liner and liquids collection system beneath the CWU. At a minimum, the liner system will include 3 feet of clay which will be placed and densely compacted in 6 inch layers under the supervision of an independent licensed Professional Engineer. Two layers of 60-mil thick high density polyethylene (HDPE) geomembrane, separated by a highly transmissive geonet drainage layer will directly overlie the

recompacted clay liner. High density polyethylene geomembranes are impermeable and have been shown to last for centuries. Additionally, CLI will include a geocomposite clay liner and a third HDPE geomembrane along the landfill floor. This liner system substantially exceeds all Toxic Substances Control Act (TSCA) and RCRA requirements and provides a redundancy that will ensure protection of groundwater resources.

- Clinton Landfill, Inc. will cap the landfill to fully encapsulate the wastes and to prevent storm water from infiltrating into the landfill. The cap will include a 12-inch layer of recompacted, low permeability soil and an HDPE geomembrane installed under the supervision of an independent licensed Professional Engineer. A drainage layer and 3 feet of protective soil will overlie the geomembrane. The surface will be contoured and vegetated to prevent erosion. This cap will further reduce the generation of leachate. It should be noted that leachate head generation on the bottom of the landfill will be minimal, not exceeding 1 foot during the life of the facility, reducing the outward force on the liner and the potential for leachate to migrate out of the landfill.

- The landfill performance will be actively monitored throughout its operating life and following closure. All potential routes of environmental exposure, e.g. groundwater, surface water, and air, will be monitored for PCBs and other chemicals to verify zero environmental impairment. In addition, soil gas surrounding the CWU and the landfilled waste within the CWU will be monitored for the presence of landfill gas.

- Clinton Landfill, Inc. will monitor and maintain the closed Chemical Waste Unit forever (i.e. in perpetuity), as required by the EPA. Leachate will continue to be extracted and groundwater quality will be monitored as long as leachate is present in the unit. In addition, the cap will be inspected and maintained to ensure its long-term performance.

The hydrogeologic setting at the CWU is ideal for a modern landfill. Review of boring logs below the facility indicate that there is at least 150 feet of in-situ clay between the landfill liner system and the Mahomet Aquifer (See Figures 2 and 3). The clayey deposits beneath the site have existed for over 10,000 years (much longer than recorded human history) and act as an aquitard. An aquitard is defined as a water-saturated sediment or rock whose permeability is so low it cannot transmit any useful amount of water. Therefore, the clayey deposits will act as a permanent barrier and supplement protective design features of the landfill by restricting contaminant movement from the landfill in both vertical and horizontal directions. The presence of this extremely thick and massive clay is why the ISGS identified this site as having one of the best hydrogeologic settings for a landfill in the state (See Figure 4).

While the CWU's redundant liner and leachate collection systems will prevent landfill leachate from migrating to the underlying aquifers, extremely conservative modeling demonstrates that PCBs would not migrate to underlying aquifers even if the proposed liner systems do not exist. This is due to the inherent immobile nature of the PCBs which cause them to bond strongly to the clay and not travel through the clays which underlie the landfill. Put simply, the clay directly below the liner would act like a sponge sucking up the PCBs and containing them. Additional details are provided in our response to USEPA Comment No. 4.

As a result of these factors, the Mahomet Aquifer will never be impacted by the CWU. With no impact to the Mahomet Aquifer, forecasting of groundwater withdrawal rates in the Mahomet Aquifer and their affects on groundwater flow direction is not a concern. Regardless

of the point that the Mahomet Aquifer will not be impacted, groundwater flow directions in the Mahomet Aquifer (within the 15-mile radius of the site) have been consistent for the last ten years (as shown on Figure 5, generated in 1995 and compared to the groundwater flow direction shown on Figure 1, generated in 2007) and one would expect growth (population and groundwater usage) to continue as it has over the last ten years.

3) *For example, there is an 11-well drinking-water supply field described by the Illinois State Water Survey for the City of Clinton approximately 8,600 to 10,500 feet north and northwest of the landfill and a 12-well field for Weldon Springs located 3,900 to 6,700 feet east northeast of the landfill. They may be outside of the minimum area of influence under the requirements for municipal solid waste landfills but they are still within the area of concern for many users of that water. The potential impacts of the entire landfill on those well-fields should be evaluated and clarified.*

Applicant's Response: As discussed above, an investigation into all community water supply wells within 15 miles of the facility has been performed. This part of the investigation focused on the well fields for the City of Clinton and Weldon Springs State Park. As shown on Figure 6, the City of Clinton well field is located on the southern end of the City and the Weldon Springs well field is located around the lake within Weldon Springs State Park. Figure 6 demonstrates that the City of Clinton well field is not located down-stream of the site and that the Weldon Springs well field is located up-stream of the site. Therefore, the well fields for the City of Clinton and Weldon Springs will never be impacted by the CWU.

Based on the surface water elevation (691 feet mean sea level (msl)) reported for the lake located within Weldon Springs State Park (See Figure 6), it appears that the springs that feed the lake are located near this elevation and are likely related to the discontinuous sands of the Tiskilwa Formation. The CWU floor will be located below the Tiskilwa Formation at an approximate elevation 660 feet msl, or about 30 feet below the lake surface water level and, therefore, the landfill will not affect the Tiskilwa Formation or the springs in Weldon Springs State Park.

4) *We are pleased to see the detailed geochemical groundwater models you provided, but the new material focuses on impacts to a thin sand body about 20 feet below the waste. That sand body is related to surface water issues and is far from the aquifer of concern. Although the numerical modeling for the Mahomet Aquifer included in your original application suggests protectiveness, the model needs some more work to be used effectively. For example, the basis for the selection of various particular numbers and assumptions used in the model is very abstract and quite involved. Since the modeling is of critical importance and will likely need to be explained to many people, the modeling should be supplemented by information using language that can be easily understood by the public.*

Applicant's Response: As mentioned earlier, there is at least 150 feet of in-situ clay between the landfill liner system and the Mahomet Aquifer (See Figures 2 and 3). The clay will act as a permanent barrier and supplement protective design features of the landfill by restricting contaminant movement from the landfill in both vertical and horizontal directions. As described above, the recompacted clay liner alone would prevent PCBs from impacting underlying aquifers even if the proposed multiple geomembrane liners at the facility did not exist.

The ability of the natural clay to absorb the PCBs can be demonstrated by using a simple conservative groundwater model that assesses how PCBs in leachate, sitting directly on top of the 3 foot recompacted clay liner (constructed out of the native clays at the site), would move vertically through the proposed clay liner. Such a model was performed for the proposed site and a brief discussion on the model is provided in Attachment 2. The model is based on the assumption that leachate will contain 500 ppm PCBs. This is extremely conservative since data from PCB landfills demonstrate that leachate PCB concentrations are likely more than 100,000 times less than this assumed concentration. Regardless, even at this concentration, (500 ppm), the PCBs groundwater model assessment demonstrates that PCBs will not migrate out of the 3 foot recompacted clay liner even after 1,000 years.

It should be noted that the model discussed above did not include the additional 150 feet of in-situ clay, three layers of 60-mil thick HDPE geomembrane, or the geocomposite clay liner.

The results of the PCBs groundwater model assessment further strengthen the conclusion that the Mahomet Aquifer and other local and regional groundwater and surface water resources will never be impacted by the proposed CWU.

January 6, 2009 Comments

1) *Groundwater Impact Assessment Report: We are concerned that the groundwater impact assessment report and the tables summarizing your data may be ignored. We request you prepare a summary of the report, suitable for general use, to add to the document you sent us. As discussed with my staff, please include contoured chemical concentrations plotted onto geological cross sections to show flow through the soil profile and indicate how the Mahomet Aquifer is being protected.*

Applicant's Response: As mentioned above in the response to USEPA Comment No. 4, a PCBs groundwater model assessment was performed for the proposed site and a brief discussion on the PCBs groundwater model is provided in Attachment 2. The PCBs groundwater model assessment indicates that PCBs will not migrate out of the 3 foot recompacted clay liner even after 1,000 years. The groundwater model used input parameters which more accurately and realistically reflect site conditions and was developed to simplify the modeling performed for the proposed CWU and make it more easily understood by the general public. Geological cross-sections depicting predicted chemical concentrations were not created due to the lack of PCB contaminant movement into the underlying in-situ clays. The PCBs are being contained within the 3 foot recompacted clay liner for at least 1,000 years. As stated above, this does not even consider the geosynthetic liner system or the 150 feet of in-situ clay beneath the recompacted clay liner which further demonstrates that the CWU will never negatively impact the Mahomet Aquifer.

2) *Methane Recovery in adjacent cells: We find that the TSCA application did not provide sufficient information to assure EPA that the proposed PCB cell, or monitoring of it, would not be affected by the RCRA Subtitle D cell. Please provide additional information to address this matter, including information on fire control and the monitoring and control of landfill gas.*

Applicant's Response: There are several design features that will prevent any adverse effects on the PCB cell (CWU) from the RCRA Subtitle D Cell (Municipal Solid Waste (MSW Unit), mainly preventing methane gas generated by the MSW Unit from infiltrating into the CWU.

The primary design feature is installation of a separation layer between the MSW Unit and the CWU, as shown on Drawing No. D9 of the original USEPA application. This layer will act as a barrier layer, preventing methane intrusion into the CWU.

A gas collection system will be installed and operated in the MSW Unit in accordance with both federal (40 CFR Part 60 Subpart CC) and state regulations (35 Ill. Admin. Code Section 811.311), thereby eliminating the migration of methane gas outside of the MSW Unit. The gas collection system consists of a series of vertical gas extraction wells connected to a vacuum blower via header and branch piping. The extracted gas will be beneficially used or flared. The spacing of the vertical gas extraction wells is established such that that the sphere of influence for each well overlaps the spheres of influence of adjacent wells. As shown on Drawing No. D23 (See Attachment 3), vertical gas extraction wells will be installed adjacent to the PCB cell. Due to the locations of these vertical gas extraction wells, the MSW unit, including the MSW wedge, will be under vacuum, therefore eliminating the potential for methane intrusion into the PCB cell.

Two landfill gas monitoring wells will be installed in the CWU Unit to monitor for the presence of methane. Locations are shown on Drawing No. D23 (See Attachment 3).

Additional monitoring and control of landfill gas will be accomplished through the following methods:

- Perimeter gas probes are installed around the property boundaries to monitor for any gas that may migrate outside the waste boundary. Drawing No. D23 shows the locations of the perimeter gas probes and is included in Attachment 3.

- The MSW Unit gas extraction wells will be closely monitored for gas quality, oxygen intrusion and vacuum applied by the gas collection system in accordance with 40 CFR Part 60 Subpart CC and 35 Ill. Admin. Code Section 220.220. The gas collection system will be operated such that the gas quality and vacuum are maintained at each extraction well to ensure that the gas is well controlled and does not cause an underground fire.

- Surface emissions monitoring will be conducted on a quarterly basis across the surface of the CWU and MSW Unit to confirm that landfill gas is controlled.

Besides the extensive measures that will be taken as described above to prevent fires resulting from methane gas, the facility's Operating Plan incorporates additional procedures that are established to prevent fires. These procedures include testing wastes prior to acceptance to ensure that they are compatible. Other fire prevention and control procedures are provided in the facility's Hazard Prevention and Emergency Response Plan, which is incorporated into the Operating Plan (See Attachment 4).

3) *Groundwater controls: There are minor amounts of groundwater present within the local clay pan. Please use the Groundwater Impact Assessment to explain the significance of potential pathways to Salt Creek or to the Mahomet Aquifer.*

Applicant's Response: As shown on Figure 3, Salt Creek is approximately 1,480 feet from the landfill waste boundary. As discussed above, the PCBs groundwater model assessment

demonstrates that PCBs will not migrate out of the 3 foot recompacted clay liner even after 1,000 years. Therefore, there is no potential for migration of PCBs to Salt Creek.

While incorporating the in-situ clays surrounding the proposed CWU to the groundwater model would provide even more protection to the Salt Creek and the Mahomet Aquifer, the in-situ clays were conservatively not included in the groundwater model.

In addition, CLI will routinely monitor groundwater quality within the upper saturated units immediately down-stream of the CWU. These monitoring activities will provide fail-safe assurance that neither Salt Creek nor the Mahomet Aquifer will be affected by the CWU.

4) *Site properties: Identify and explain the importance of any designated, published or otherwise unusual natural features known to make the location of the proposed cell favorable or not favorable for landfilling?*

Applicant's Response: An extensive study was conducted by CLI to determine if there were any natural features present that would make the location unfavorable for a landfill. The natural features at the site and surrounding vicinity are well understood as a result of this study. No unusual natural features are present, and all information collected demonstrates that the location of the facility is favorable for landfilling.

The study included extensive geological, geotechnical and hydrogeological investigations to thoroughly characterize the natural geological features. These investigations included reviewing the historical geological, geotechnical, and hydrogeological information that was collected during construction and operations of the existing landfills. This information was supplemented by additional soil borings, monitoring wells, topographic mapping, aerial photo review, etc.

Besides conducting the investigations described above, CLI submitted facility plans to multiple state and federal agencies for their reviews of the proposed landfill location. The results of these reviews were provided in the Location Report (Section 1) of the original application dated October, 2007. A summary of the findings are provided below:

- The nearest airport is over six miles away.
- The U.S. Army Corps of Engineers concluded that there are no wetlands present within the landfill footprint.
- FEMA maps demonstrate that the landfill is outside the 100-year floodplain.
- USGS documentation states that the landfill is not within an active fault zone or unstable area.
- Illinois Department of Natural Resources correspondence states that the landfill will not impact nearby surface water quality.
- The Illinois Historic Preservation Agency concurred with the results of the site specific Archaeological Survey, which found no significant historic, architectural, or archaeological resources present.

- The Illinois Nature Preserves Commission confirmed that the landfill does not pose a threat to a dedicated nature preserve.

There are several site features that make this location favorable for landfill development:

- An existing landfill is present. Therefore, much of the necessary infrastructure is already in-place.

- The ISGS concluded that the landfill location is one of the best locations for a landfill due to the thick deposits of low permeability glacial till present between the ground surface and the drinking water aquifer (See Figure 4).

There are sufficient volumes of low permeability soil available at the site for landfill construction and operation. These materials have been successfully used to construct and operate the existing landfills for more than 20 years.

5) *Site materials: The soil making up the recompacted clay liners does not meet TSCA requirements for liquid limit and plasticity. While there are many protective measures built into the landfill that contribute to design safety, such as membrane liners, underdrains and composite liners, the clay liners are still important. Please submit evidence to show, given soil moisture and plastic clays at depth, how the recompacted clay liners would not necessarily be subject to desiccation cracking and might perform as well as if it were built of material that meets TSCA requirements.*

Applicant's Response: Federal regulation 40 CFR 761.75(b)(1) requires that the landfill be located in thick relatively impermeable formations such as large area clay pans or utilize a recompacted soil liner meeting certain specifications. Federal regulation 40 CFR 761.75(b)(2) states that a 30 mil thick synthetic liner may substitute for facilities not located within areas with thick relatively impermeable formations or for recompacted soil liners which do not meet the specified properties. The proposed CWU is located within an area with thick impermeable large-area clay pan that exhibit high clay and silt content (glacially derived Tiskilwa, Berry, and Radnor Till units). As a redundant safety factor, CLI will install a multi-layer engineered liner system that consists of recompacted soil, geosynthetic clay, and synthetic geomembrane liners with a combined thickness of 180 mils (6 times the thickness listed in the regulations) on the landfill floor.

Clinton Landfill, Inc. has successfully utilized the on-site clays to construct landfill liners for more than 20 years. These liners have been demonstrated to exhibit a permeability equal to or less than that specified, i.e. 1×10^{-7} centimeters per second (cm/sec) by both field and laboratory testing. Permeability is the most important of the properties listed at 40 CFR 761.75(b)(1) as it is a measure of the clay liner's ability to prevent seepage. A copy of an independent report of a test liner constructed using soils from the same geologic unit as will be used for the CWU recompacted clay liner is provided in Attachment 5. That report demonstrates the suitability of the on-site soils for use in constructing recompacted soil liners.

A review of the historical data shows that the on-site soils meet all but two of the properties indicated above, i.e. liquid limit and plasticity index. These properties are known as index properties and are generally used to help predict whether a soil will achieve other overriding physical properties, e.g. permeability. The liquid limit and plasticity index of the on-site soils

are slightly lower than those indicated, which means that the on-site soils are less susceptible to swelling and shrinkage (which can result in dessication cracking) upon changes in moisture content than soil with a higher liquid limit and plasticity index. In addition, soils with a lower liquid limit and plasticity index are typically stronger than soils with higher values.

The project specifications require that the soil liner meet the necessary performance standards which include a permeability less than or equal to 1×10^{-7} cm/sec, as well as a certain moisture content. The specifications also require that the contractor protect the recompacted earth liner from dessication cracking. An independent licensed Professional Engineer will implement the Construction Qualify Assurance (CQA) Plan (included in the October 2007 application) to verify and document that all project specifications, including soil liner permeability and moisture content, are met. Upon completion of each stage of liner construction, the independent licensed Professional Engineer will prepare and certify a CQA report documenting that the soil liner meets the permeability and other project specifications. The CQA report will be submitted to the Illinois EPA for approval prior to waste acceptance.

Once covered by the geomembrane liner, the recompacted clay liner will not be subject to air drying. The only other potential mechanism for dessication is drying by gravity drainage. However, the specified recompacted clay liner moisture content is well below the material's field capacity (i.e. the moisture content above which soil moisture will drain by gravity) and, therefore, will not lose moisture (i.e. dessicate) by gravity drainage. The invert (landfill bottom) of the CWU will be keyed into or located directly above the Berry Clay. The Berry Clay acts as vertical groundwater barrier (aquitard) therefore small quantities of groundwater will be present. This groundwater will serve to hydrate the soil liner and prevent drying and cracking (desiccation) of soil liner.

6) *Geotechnical stability models: We are concerned that the landfill sub-base geotechnical slope stability model may not have enough resolution. It appears the slope stability models did not adequately include either the Berry Clay outside the cell or the bentonite liner inside the cell. Please explain how they would affect the output of the model or how their presence was otherwise factored into the overall assessment.*

Applicant's Response: A baseline slope stability analysis was rerun using soil strength parameters specific to both the Berry Clay and the Radnor Till soils. A sensitivity analysis was run with the minimum measured strength parameters of the Berry Clay. Both the baseline and sensitivity analyses all exceed required factors of safety for all of the failure scenarios. The additional slope stability analyses are provided in Attachment 6.

The bentonite liner was taken into consideration in the slope stability analysis. The bottom liner system consists of several components, such as HDPE geomembrane, GCLs (bentonite liner), soil barriers, etc. The stability of the liner system is partially dependent on the interface shear strength between these components. Because the thicknesses of the geosynthetic components are minimal, it is accepted engineering practice to model the interfaces as a single interface. When this is done, the lowest (critical) interface shear strength is used in the analysis. The critical shear strength used in the stability analysis is based on industry standards, site-specific testing of, and historical experiences with the various liner system components, including the bentonite liner. The construction specifications for the CWU liner system components require that the various interfaces achieve the design critical shear strengths. As a redundant measure, the Construction Quality Assurance (CQA) plan requires

that the interface shear strength of each component of the liner be tested during liner construction. These results will be submitted to the Illinois EPA prior to waste acceptance in the landfill unit, to ensure the liner meets design specifications. We note that the test procedure for the bentonite liner inherently tests both the interface shear strength and the shear strength of the GCL itself (i.e. its internal shear strength).

Therefore, the analyses which incorporate the Berry Clay and Radnor Till soils and the specified liner component interface shear strengths demonstrate that the CWU will be stable. Furthermore, CQA testing during construction will be performed to ensure that the specified interface shear strengths are attained.

7) *Disposal of leachate: A disposal plan for the TSCA cell's leachate is required.*

Applicant's Response: The Leachate Storage and Disposal plan for the CWU is included on Pages 19-21 of the Chemical Waste Unit Operating Plan in Attachment 4. The Plan states that leachate generated in the CWU will be stored on-site in a 35,000 gallon double-wall underground storage tank (UST) with secondary containment. Leachate with less than 50 ppm PCBs will then be solidified and disposed in the CWU or other landfill that is permitted to accept such waste, or transported to an off-site commercial or municipal wastewater treatment facility for treatment. A letter from the PDC wastewater treatment plant demonstrating their ability to accept leachate from the CWU is included in Attachment 7.

Leachate containing 50 ppm or more PCBs will be managed in accordance with the requirements of 40 CFR Part 761.60(a).

8) *Waste acceptance criteria: The waste acceptance and analysis plan must include not only testing for chemical waste incompatibility but potential problems that could develop in the TSCA cell* due, for example, to recirculation of leachate and acceptance of gypsum drywall.

Applicant's Response: The facility will only accept non-hazardous pollution control wastes as defined in the Illinois Environmental Protection Act, industrial process wastes and various wastes contaminated by PCBs (including, but not limited to, PCB Articles, PCB Containers, PCB Bulk Product Waste, etc.). It is also possible that the CWU will accept PCB-contaminated wastes from landfill remediation projects. Only de minimus quantities of gypsum drywall that are commingled with other waste will be accepted. Bulk quantities of gypsum drywall will not be accepted at the CWU. In addition, leachate will not be recirculated into the CWU.

The facility's Operating Plan has been revised to require that all waste streams accepted for disposal be tested and reviewed by CLI's Waste Acceptance Committee to ensure that the various waste streams will not interact and form hazardous gases. The revised Chemical Waste Unit Operating Plan detailing the waste acceptance and analysis plan is included in Attachment 4.

9) *Railroad Waste Handling Facilities: Ensure that the new rail head is in compliance with all Department of Transportation and Department of Homeland Security and any other regulations.*

Applicant's Response: Although operation of the subject rail facilities falls outside the scope of the permit application for the CWU, any rail operations conducted at the facility will fully comply with all applicable regulations administered by all Federal and State regulations regarding the transportation, packaging, and handling of hazardous materials. Prior to engaging in any activity within the scope of those regulations, the facility will develop and implement a compliant plan.

The following is a brief summary of regulations related to transporting hazardous materials by rail. Many of these regulations apply only to entities that transport or offer to transport hazardous material by rail. We note that, while the facility will be receiving wastes, it will generally not be transporting or offering to transport hazardous materials from the facility.

The construction, development, and operation of the rail off-loading facility is permitted by the Illinois Environmental Protection Agency (IEPA) in accordance with:

- Title 35, Illinois Administrative Code, Subtitle G, Parts 811 and 812, pursuant to 35 Ill. Adm. Code, Section 813.104.

- Designs, plans, and specifications provided by the IEPA under application Log No. 2007-459, including all approved addendums and modifications encompassing:

    - Rail Off-Loading Facility,
    - Gondola Off-Loading Area, and
    - Intermodal Off-Loading Area.

The facility will comply with the applicable requirements in sections 49 CFR 172.70 & 49 CFR 172.800-804. These requirements are outlined by the Department of Homeland Security (DHS) and the Department of Transportation (DOT) during risk assessments and security reviews and also build upon existing DOT hazardous materials regulations. In particular these require each transporter of hazardous materials, to develop and implement security plans and to train appropriate employees in security measures. The Department of Homeland Security and Department of Transportation issued these voluntary action items as measures that should be considered when security plans are developed, implemented, and revised. The action items are voluntary to allow facilities to adopt measures best suited to their particular circumstances provided the measures are consistent with existing regulations. Since the rail transload station will be within the permit area of the facility, many of these requirements, such as fencing and secured entrances will already be in place.

The facility's rail infrastructure will be designed, constructed, and maintained in compliance with the application sections of Federal Railroad Association (FRA), Department of Transportation 49 CFR Part 213.1 – 213.241. These regulations dictate compliance with Track Safety Standards including;

- Roadbed,
- Track geometry,

- Track structure, and
- Track appliances and track related devices.

Federal Regulation 49 CFR Part 214, Subpart C focuses upon Railroad Workplace Safety Training. Clinton Landfill, Inc. (CLI) will comply with the applicable sections of these regulations as well as those promulgated by the Occupational Safety and Health Administration (OSHA) Regulations under the Clean Railroads Act of 2007 do not apply since the rail off-loading facility does not meet the definition of a rail transfer station and has been permitted by the State of Illinois.

Clinton Landfill, Inc. will not be subject to the Pipeline and Hazardous Safety Adminstration rule that became effective December 26, 2008 (73 FR, November 26, 2008), which regulates the transporation of certain hazardous materials by rail. Specifically, CLI is will not ship or receive by rail specific explosive, toxic by inhalation, or radioactive materials.

Similary, the CLI facility will not be subject to the Transporation Security Adminstration rule that became effective December 26, 2008 (73 FR, November 26, 2008), which promulgated security requirements for specific hazardous materials shipped or received by rail. Specifically, CLI will not ship or receive by rail the specified explosive, poisonous by inhalation, or radioactive materials.

10) *Financial Assurance: Provide the proposed financial assurance mechanism.*

Applicant's Response: Financial assurance for the unit will be provided by use of a combination of financial mechanisms specified in Illinois Administrative Code Title 35, Section 811.707 (See Attachment 11). The mechanisms must be as specified in 35 Ill. Admin. Code Sections 811.710, 811.711, 811.713, and 811.714 (See Attachment 11).

11) *PCB articles and article containers: Include how you proposed to accept and dispose of PCB articles and article containers.*

Applicant's Response: The majority of waste accepted at Clinton Landfill will be contaminated soils not contained within PCB articles or article containers. The small percentage of waste that consists of PCB articles or article containers will only be accepted if it has been prepared in accordance with the requirements of 40 CFR Part 761.60 (b) and (c). A specific disposal plan for PCB articles, containers and article containers is included on Pages 9 and 10 of the facility's Operating Plan in Attachment 4.

12) *Leak Detector: What measures have been taken to block infiltration of water into the leak detector?*

Applicant's Response: The Leak Detector (redundant leachate collection system) consists of a high density polyethylene (HDPE) geonet sandwiched between two HDPE geomembranes. The redundant leachate collection system drains into a separate sump and riser which consists of an 18 inch diameter HDPE pipe. The geomembrane panels that sandwich the HDPE geonet will be seamed on each edge thereby creating a continuous sheet across the bottom of the landfill. The geomembrane will prevent both leachate and groundwater leakage into the redundant leachate collection system.

As shown on Drawings Nos. D7, D8, and D9 from the original application, the perimeter edge of the redundant leachate collection system will be sealed to prevent stormwater infiltration.

The regulations in 35 Ill. Adm. Code 724.401(c)(5) state that an operator "must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of groundwater". For this reason, the HELP Model for the Chemical Waste Unit (Appendix I of the original USEPA application) conservatively assumed the effects of groundwater infiltration to demonstrate that the leak detector will not be adversely impacted by groundwater infiltration. The results are summarized below:

- The groundwater seepage rate of 0.0548 inches/year, calculated in Appendix B.2 of the original USEPA application, is a conservative value based on the maximum groundwater head at the lowest point of the CWU. In reality, the groundwater seepage rate will decrease as the elevation of the landfill liner increases. This low rate of seepage will not impact the ability of the system to detect leakage through the primary liner.

- The results of the HELP Model predict that the maximum head in the leak detection system, which includes infiltration of groundwater, will be 0.001 inches, which is significantly less than the thickness of the leak detector (0.20 inches). These results demonstrate sufficient flow capacity through the leak detector to safely transmit any liquids, including groundwater seepage.

Regardless of the source, all liquids collected in the redundant leachate collection system will be managed as leachate in accordance with the facility's Operating Plan.

13) *ID numbers: As described in 40 CFR 761.205, please notify United States Environmental Protection Agency, Washington D.C. Office of Solid Waste of your application to dispose of PCBs.*

Applicant's Response: Clinton Landfill Inc. has submitted its notification of PCB Activity (USEPA form No. 7710-53) as required by 40 CFR 761.205. The notification was sent on January 29, 2009, via USPS certified mail, return receipt requested. A copy of the returned receipt is provided in Attachment 8.

14) *Cleanouts and Man ways: Show proposed cleanouts and man ways and how they will provide sufficient access and resist crushing, kinking, consolidation related down-drag or anything else that might limit leachate removal and leak detector operations.*

Applicant's Response: The primary leachate collection sumps in the CWU will consist of thick-wall 18" diameter HDPE pipes which will extend along the sideslopes of the cell to the leachate collection layer. The size of the sumps will allow for easy cleaning. Additional cleanouts consisting of 6" diameter HDPE pipes will run along both sides of each sump to provide access to the leachate collection pipes along the bottom of the cell. A redundant system of 18" leachate collection sumps (leak detector) will be constructed above the bottom layer of geomembrane to ensure that all leachate is collected. Drawing No. D8 in Attachment 3 shows the leachate collection sumps and cleanouts.

Calculations submitted in Appendix I of the original USEPA application ensure that all of the 6" diameter pipes installed as part of the leachate collection system will not be adversely affected by ring deflection, buckling or crushing due to waste loads in the CWU. Calculations provided in Attachment 9 demonstrate that the 18" riser pipes will not be adversely affected by ring deflection, buckling or crushing. A geomembrane rub sheet (See Drawing No. D8) will be installed at the bottom of each 18" sump pipe to provide additional protection to the geomembrane liner.

No manways will be used in the CWU, and the leachate collection sumps and adjacent cleanouts will be well supported by the recompacted clay liner. Therefore, consolidation-related downdrag and kinking will be minimal. Calculations demonstrating that the liner or leachate collection systems will not be impacted due to downdrag forces or kinking are provided in Attachment 9. Additionally, the sideslopes of the cells will be constructed with a 3H:1V slope, minimizing frictional forces on the sumps and cleanouts due to consolidation.

In addition to the USEPA review of the TSCA Application for a CWU at the Clinton Landfill No. 3, the Application was reviewed by the neighboring Macon County Solid Waste Management Department. The department found that the Application meets and/or exceeds the requirements of TSCA (See Attachment 10), providing further assurance to the public that this facility will be protective of the public health, safety, and welfare.

We hope this resolves all of the comments identified by the USEPA in the preliminary notice of deficiency letter received on August 21, 2008 and the subsequent supplemental letter received on January 6, 2009. If you have any questions or concerns please contact me at 630-762-3315.

Sincerely,
Shaw Environmental, Inc.

Jesse Varsho, P.E., P.G.
Project Manager

cc: George Armstrong, PDC
Ron Edwards, PDC
Ron Welk, CLI