

A.T. Kearney, Inc.
One Tabor Center, Suite 950
1200 Seventeenth Street
Denver, Colorado 80202
303 572 6175
Facsimile 303 572 6181

Management
Consultants

#7

AT KEARNEY

To: J. Bober
Company _____
From G. Stankelbaum
Telephone Number (303) 572-6175

Date 2/9
Fax Number 505-827-1544
Number of Pages (including this Page) 12
Charge Number _____

Message

- ① Apologies again - my schedule has been rearranged by EPA - gone to Carlsbad until Wednesday. Hope to get final draft to you by Thursday or Friday.
- ② 2nd Rough/partial draft - about 1/2 way through design deficiency comments
- ③ We can't find Tables 3-1 and 3-2, and Plates 3-2, 3, 5 and 6. If you have them, can you please have them faxed to Mohamed Nur - Fax 703-683-2409 Voice - 703-739-1614. I expect the Plates are oversize - perhaps reduce or copy in pieces -

Confidentiality Notice

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Thanks,

**TRIASSIC PARK WASTE DISPOSAL FACILITY
GANDY MARLEY, INC.
TATUM, NEW MEXICO**

**RCRA PART B PERMIT APPLICATION
DEFICIENCY COMMENTS
February 1997**

Comment headings correspond to applicable items in the accompanying checklist, and 40 CFR Section Numbers.

A. PART A APPLICATION: 270.10(d), 270.11(a) and (d), 270.13

The permit application must be signed in accordance with 40 CFR Section 270.11(a). In addition, the facility must obtain an EPA I.D number and include it in the Part A.

A comment in section XIX of the Part A states that the impoundment is shown as "storage" in Section XII. However, the storage designations in section XII appear to include only the container storage areas (not including the stabilized waste rolloff containers), while the 3.5 million gallon capacity is identified as T02 (treatment surface impoundment). Revise the Part A to correct this mistake.

As explained in comment D-1, the Part A must be revised to include the stabilized waste rolloff storage area.

The Part A indicates "U" as the unit of measure for the T01 units in section XII. This unit is not defined, and is not acceptable for use in the Part A. Revise the Part A to correct this mistake.

B. FACILITY DESCRIPTION

B-2 Topographic Map

B-2a General Requirements: 270.14(b)(19)

The application does not provide appropriate scale maps to show the details and features of the facility and the surrounding area. The topographic maps presented in the application (Figures 1-2, 3-2, Plate 3-7) are at a scale of 1" = 1000' and 1" = 2000'. In addition, facility location is not marked on some of the figures provided (e.g., Figure 3-2). Submit a topographic map that shows the facility and a distance of 1,000 feet around it at a scale of 1 inch equal to not more than 200 feet. The map must include contours sufficient to show surface water flow in the vicinity of and from each operational unit (e.g., contours of 5 feet if relief is greater than 20 feet; contours of 2 feet if the relief is less than 20 feet). The map must include map date, 100-year floodplain area, surface waters, surrounding land uses, a wind rose, map orientation, and legal boundaries of facility site. The map must also indicate the location of access control, injection and withdrawal wells, buildings, structures, sewers (storm, sanitary and process), loading and unloading areas, fire control facilities, flood control or drainage barriers, runoff control systems, and (proposed) new and existing hazardous waste management units and solid waste management units. Note: Multiple maps may be submitted, but those which provide the above required information must be at a scale of 1 inch equal to not more than 200 feet.

B-2b Additional Requirements for Land Disposal Facilities: 270.14(c)(3) and (4)(I), 264.95, 264.97

The topographic map also must indicate the waste management area boundaries, the property boundaries, the proposed point of compliance, the proposed groundwater monitoring well locations, the locations of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility (including flow direction and rate), and if present, the extent of the plume of contamination that has entered the groundwater from a regulated unit. Note: Multiple maps may be submitted, but those which provide the above required information must be at a scale of 1 inch equal to not more than 200 feet.

B-4 Traffic Information: 270.14(b)(10)

The application (section 1.5) does not address the information required by 40 CFR 270.14(b)(10). Provide the following traffic related information:

- Traffic patterns on site;
- Estimated volumes, including number and types of vehicles;
- Access roadway surfaces and load bearing capacity.

C. WASTE CHARACTERISTICS**C-1 Chemical and Physical Analyses: 270.14(b)(2), 264.13(a)**

The waste analysis plan (section 5.3) does not provide commitments to obtain and maintain adequate waste records at the facility. For each hazardous waste stream to be stored, treated or disposed at the facility, the information to be maintained in the facility operating record must describe the waste, the hazard characteristics, the basis for hazard designation, and provide a laboratory report detailing the chemical and physical analyses of representative samples. At a minimum, the records must include all the information that must be known to treat, store, or dispose of the waste in accordance with 40 CFR Part 264 and 268 requirements. Revise the application to identify the waste analyses, and other records specifically related to each waste stream, which will be maintained on-site.

C-1a Containerized Waste: 264.175, 270.15(b)(1)

The container storage discussion (2.2) does not provide for testing of wastes in the rolloff storage area(s) for free liquids. Section 6.4.7 indicates that only visual inspections will be used to determine if free liquids are present in wastes proposed to be landfilled (e.g., in rolloffs). If containers of wastes are to be stored without a secondary containment system (as proposed for the stabilized waste rolloff storage area), the application must provide test procedures, other documentation or information which shows that the wastes will not contain free liquids. A suggested test for free liquids is the Paint Filter Liquids Test, Method 9095 in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods," EPA Publication No. SW-846. If such storage will not occur on site, state so in the text of the Part B permit application, and revise the design for both halves of the rolloff storage area (to include a sufficiently impervious surface) as required to comply with 264.175.

The container storage building discussion (2.2.1.1) does not address the requirement in 264.175(b)(1) for the storage area base to be "sufficiently impervious" to contain releases. However, section 9.2.1.3 notes that the concrete floor in the drum handling facility will be "uncoated". Uncoated concrete is not adequately impervious, and will absorb liquids even where typical cracking, surface erosion, and construction joints do not exist. Revise the application to provide for surface coating of the drum handling building floor. If adequate testing is not provided to ensure that incoming rolloff containers do not contain free liquids, the incoming rolloff area must be constructed with a similar base.

C-1b Waste in Tank Systems: 264.190(a), 264.191(b)(2), 264.192(a)(2)

The application (2.3 and 2.4) does not address compatibility of wastes and tank construction materials. From the information provided, it must be assumed that both the enclosed storage tanks and the stabilization "bins" will be constructed of bare steel. However, many of the wastes proposed for acceptance at the facility, such as strong acids, bases, and other reactive materials, may rapidly corrode or violently react with the tank shell. Provide the hazardous characteristics of wastes to be handled in the tank systems, and demonstrate that the tank construction materials are compatible with the wastes to be stored in the tanks.

C-3a(1) Spent Solvent and Dioxin Wastes: 264.13(a)(1), 268.2(f)(1), 268.7, 268.30, 268.31

Section 5.1.2 notes that dioxin wastes will not be accepted, but methods for complying with solvent waste treatment standards is not addressed. Describe procedures that will be used to determine whether F001-F005 spent solvent wastes meet the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology.

C-3a(2) California List Wastes: 264.13(a)(1), 268.7, 268.32, 268.42(a), RCRA section 3004(d)

The waste analysis plan does not address California wastes. Describe procedures that will be used to determine whether a waste is a California list waste prohibited from land disposal and whether the waste is subject to treatment standards outlined in 268.42(a). Process knowledge can also be used to make this determination.

Although California list restrictions have largely become obsolete as treatment standards have been issued for specific hazardous wastes, California list restrictions still apply in the following instances:

- Liquid hazardous wastes containing PCBs at concentrations greater than or equal to 50 ppm;
- Liquid characteristic wastes containing over 134 mg/l nickel and/or 130 mg/l thallium;
- Characteristic wastes containing Halogenated Organic Compounds (HOCs) at concentrations greater than or equal to 1000 mg/l (liquids) or mg/kg (solids), where the HOCs are not derived from listed hazardous wastes (i.e., F-, K-, P- or U-listed wastes); and
- During any nation-wide extension to the effective date for either a characteristic or listed waste.

Newly listed or newly identified wastes are not subject to the California list prohibitions.

C-3a(7) Lab Packs: 268.7(a)(7), 268.7(a)(8), 268.42(c), Part 268 Appendix IV, Part 268 Appendix V

The application (section 5) does not address requirements for acceptance of lab packs. Prior to being land disposed, the wastes contained in a lab pack must meet all applicable treatment standards for each waste type. Describe procedures that will be used to determine whether lab-pack wastes meet the applicable treatment standards or to demonstrate that the waste has been treated by the appropriate specified treatment technology. Process knowledge can be used to make this determination. Discuss procedures to ensure labpack wastes will meet land disposal requirements.

Alternatively, a generator can establish two general lab pack categories: (1) organometallic lab packs and (2) organic lab packs. Permissible waste code components of these two lab pack categories are listed in Appendix IV and Appendix V of Part 268. Treatment of organic lab packs requires incineration. Treatment of organometallic lab packs requires incineration followed by treatment of the residue to meet D004, D005, D006, D007, D008, D010, and D011 characteristic waste treatment standards. Lab-packs

containing California list PCBs or dioxins must be treated according to special incineration requirements detailed in 268.42(a). Discuss procedures to ensure that lab pack wastes will meet land disposal requirements.

If lab pack hazardous waste is combined with non-lab pack hazardous waste prior to or during treatment, indicate that the entire mixture will be treated to meet the most stringent treatment standard for each waste constituent before being land disposed.

C-3a(8) Contaminated Debris: 268.2(g), 268.7, 268.9, 268.36, 268.45, 270.13(n)

The application (5) does not discuss acceptance or management of hazardous debris. Debris wastes are likely to be proposed for disposal during the active life of the facility, and on-site disposal of debris from demolition of storage and treatment units at the facility is planned (e.g., section 9.2.3.2). Identify how hazardous debris will be managed. Prior to land disposal the hazardous debris must be treated according to standards provided in 268.45 (except that debris contaminated with wastes having a specified treatment technology listed in 268.42 must be treated as required in 268.42). Alternatively, the hazardous debris may be treated to meet the existing treatment standards for each waste constituent specified in 268.41, 268.42, and 268.43. Note that hazardous debris that exhibits the characteristics of ignitability, corrosivity, or reactivity must be treated using one of the extraction, destruction, or immobilization technologies identified in Table 1 of 268.45.

C-3a(9) Waste Mixtures and Wastes with Overlapping Requirements: 264.13(a)(1), 268.7, 268.9, 268.41(b), 268.43(b), 268.45(a)

The application (5) does not address waste mixtures or wastes with overlapping requirements. Revise the application to provide procedures that will be used to demonstrate that waste mixtures and wastes carrying multiple waste codes are properly characterized and meet treatment standards prior to land disposal. Wastes that carry more than one characteristic or listed waste code must be treated to the most stringent treatment requirement for each hazardous waste constituent of concern prior to land disposal.

Also revise the application to indicate that when wastes with differing treatment standards are combined solely for purposes of treatment, the most stringent treatment standard specified will be met for each constituent of concern in the combined waste prior to land disposal.

C-3a(10) Dilution and Aggregation of Wastes: 268.3

The application (2.4 and 5) does not address the restrictions on dilution as treatment. If the facility is to perform dilution or aggregation of hazardous wastes, the application must demonstrate that these activities will not be in violation of land disposal regulations. Listed wastes, if destined for land disposal, may never be diluted. Characteristic wastes that are not toxic (i.e., D001 through D003) may be diluted. Characteristic wastes that are toxic (i.e., D004 through D043) may be diluted only if: (1) the waste is to be underground injected and the characteristic is to be removed prior to injection, (2) the waste has a concentration-based and not a technology-based treatment standard, is not a D003 reactive waste, and is being treated in a system pursuant to the Clean Water Act, or (3) the waste is not destined for land disposal. Provide specific discussion addressing this issue.

A facility cannot dilute or partially treat a listed waste to switch treatability categories (e.g., switch from non-wastewater to wastewater), in order to comply with different treatment standards. Note that dewatering technologies (i.e., filtration, centrifugation, etc.) that produce a wastewater fraction and a nonwastewater fraction are not considered to be impermissible category switching. Aggregation of wastes for treatment is not considered impermissible dilution, if wastes are all amenable to the same treatment.

C-3b Notification, Certification, and Recordkeeping Requirements: 264.73, 268.7, 268.9(d)

The waste analysis plan (5) does not provide adequate procedures for preparing and/or maintaining:

- applicable notifications and certifications to comply with land disposal restrictions.
- applicable notifications and certifications for treatment residues.

Revise the application to address the following requirements:

C-3b(7) Recordkeeping: 264.73, 268.7(a)(5), 268.7(a)(6), 268.7(a)(7), 268.7(d)

Provide specific commitment and/or statements to demonstrate that the following requirements will be met:

Treatment, storage, and/or disposal facilities that manage wastes generated on-site must (1) determine if the waste is restricted from land disposal and keep documentation of that determination, and (2) maintain documentation to indicate where restricted wastes were treated, stored, and/or disposed.

Facilities managing wastes generated on-site that use only process knowledge to determine compliance with land disposal restrictions, must retain all data used to make this determination. If the owner/operator tests a representative sample of the waste to determine compliance with land disposal restrictions, all waste analysis data must be retained on-site in the facility's files.

The owner/operator of a treatment, storage and/or disposal facility managing any waste subject to land disposal restrictions must demonstrate that all notifications and certifications submitted by waste generators or other treatment, storage and/or disposal facilities will be reviewed and will be maintained as part of the operating record until closure of the facility, in accordance with recordkeeping requirements of 264.73.

Land disposal facilities are required to keep records of the quantities and date of placement of each shipment of waste placed in a land disposal unit under an extension to the effective date of any land disposal restriction pursuant to 268.5, or a no-migration petition pursuant to 268.6.

C-3c Requirements Pertaining to the Storage of Restricted Wastes: 268.50

The application does not address the prohibition on impermissible storage. An owner/operator of a treatment, storage and/or disposal facility storing hazardous wastes that are restricted from land disposal must demonstrate that (1) they are storing such wastes in tanks, containers, or containment buildings on-site and (2) such storage is solely for the purpose of accumulating sufficient quantities of waste to facilitate proper treatment, recovery, or disposal.

If prohibited wastes are stored beyond one year, the owner/operator has the burden of proving, in the event of an enforcement action, that storage is for allowable reasons.

Storage restrictions do not apply to wastes that:

- Meet the applicable treatment standards; or
- Have received a nationwide variance; or
- Have received an exemption under 268.6; or
- Have received a case-by-case extension under 268.5.

Revise the application to acknowledge the limitations on storage of restricted wastes.

C-3c(1) Restricted Wastes Stored in Containers: 268.50(a)(2)(I)

The application (2.2 and 5.2.1.2) does not address the requirement to label containers received at the facility. Revise the application to provide for marking each container to identify its contents and the date each period of accumulation begins (i.e., the date of receipt).

C-3c(2) Restricted Wastes Stored in Tanks: 268.50(a)(2)(ii)

The application does not address the requirement that restricted waste storage tanks must be clearly marked with descriptions of contents, the quantity of each hazardous waste received, and the date each period of accumulation begins, or such information must be recorded and maintained in the operating record at the facility for each restricted waste storage tank. Revise the application to explain how the facility will comply with this requirement.

C-3c(3) Storage of Liquid PCB Wastes: 268.50(f)

The application is not clear in explaining whether high concentration PCB wastes will be accepted. Section 5.1.2 appears to exclude PCB liquids with concentrations above 50 ppm, but the number was originally 500. No further discussion is provided on the limitations on PCB acceptance. If liquid wastes containing concentrations of PCBs greater than or equal to 50 ppm will be stored at the facility, demonstrate that the facility will meet the requirements of 40 CFR 761.65(b). The owner/operator must describe procedures for removal of these wastes from storage within one year and treatment or disposal of the wastes in compliance with land disposal restrictions.

D. PROCESS INFORMATION**D-1 Containers: 270.15, 264.170 through 264.178**

The rolloff storage area described in section 2.2.2 of the application (page 2-4) is proposed to consist of two pieces. The stabilized waste storage portion of the area is intended to be operated as a (less than) 90-day storage area. However, the regulation which governs less than 90-day storage areas, 262.34, applies only to generators of hazardous waste. The term "generator" is defined in 260.10. The Gandy Marley facility will not be the generator of wastes placed in this storage area, and therefore it cannot be operated as a less than 90-day storage area. The stabilized waste portion of the rolloff storage area must be included in, designed and operated as part of the permitted rolloff storage unit.

The checklist provided with the application does not include any references to the proposed container storage areas. Although references are not required, the checklist is incomplete, and it is difficult to determine where information intended to demonstrate compliance with the container storage requirements is located.

D-1a Containers with Free Liquids

The container storage discussion (section 2.2.2) does not provide any commitment to ensure that rolloffs containing free liquids will not be placed in the rolloff storage area. Therefore, the rolloff area must be designed to manage wastes which may contain free liquids (see following comments).

D-1a(2) Container Management Practices: 264.173

The application (section 2.2) does not address compliance with 264.173. Describe the container management practices that will be used to ensure that hazardous waste containers are always kept closed during storage, except when adding or removing waste, and are not opened, handled, or stored in a manner that may cause them to rupture or to leak. Include a discussion of procedures for transporting containers across the facility.

D-1a(3) Secondary Containment System Design and Operation: 270.15(a)(1), 264.175(a), 264.175(d)

The conceptual design drawing for the Drum Handling Facility (Figure 2-2) appears to indicate that the concrete floor will be underlain by a single geomembrane, with no drainage geonet. The floor drain trench appears to be designed with a secondary liner and geonet, but there is no supporting structure (e.g., concrete) under the drainage trench and sump. This design may be unstable and lead to significant movement of the foundation soil, resulting in damage to the geomembrane(s), collapse of the trench walls, and/or cracking of the floors. Releases of liquid wastes to the uncoated floor could accumulate within and below the concrete. Provide detailed, dimensioned drawings, final design discussion, and material and construction specifications for the secondary containment systems. Indicate on the drawings the areas in which incompatible wastes will be stored.

D-1a(3)(a) Requirement for the Base or Liner to Contain Liquids: 264.175(b)(1)

The application does not include detailed design drawings, descriptions, or material and construction specifications for either the container storage building (sections 2.2.1 and 2.2.4) or the rolloff area (2.2.2). However, the rolloff area is intended to have a soil surface. This area is required to have an impervious base because there is no commitment to ensure that free liquids will not be present in either the incoming or stabilized waste rolloff containers.

For both the storage building and the rolloff area, provide information to demonstrate the capability of the base to contain liquids, including:

- Statement that base will be free of cracks or gaps;
- Demonstration of imperviousness of base to wastes and precipitation;
- Base design and materials of construction (including "impervious" coating);
- Engineering evaluation of structural integrity of base; and
- Discussion of compatibility of base with wastes.

D-1a(3)(c) Containment System Capacity: 270.15(a)(3), 264.175(b)(3)

The application states (2.2.1.1 and 2.2.4) that the drum storage cells will include a sump and trench with capacity of at least ten percent of the containers in the cell, but does not provide dimensioned design drawings or calculations to demonstrate compliance with this requirement. Containment capacity of the rolloff area is described similarly (2.2.2.1). Provide calculations that demonstrate that the containment systems will have sufficient capacity to contain at least 10% of the volume of the containers in each cell (or rolloff area). This demonstration must discuss the volume of the largest container, total volume of containers, containment structure capacity, and volume displaced by containers and other structures in the containment system. For the exposed rolloff storage area, the containment capacity calculations must also include precipitation from at least the 25 year, 24 hour storm.

D-1a(3)(c) Removal of Liquids from Containment System: 270.15(a)(5), 264.175(b)(5)

The application does not address removal of liquids from the container storage building sumps. Removal of "rainfall" from the rolloff area is mentioned (2.2.2.1), but the method of removal and management of removed liquids is not mentioned. Spilled or leaked waste and accumulated precipitation must be removed from the sumps or collection areas in a timely manner to prevent overflow of the containment system. Describe the procedures and equipment to be used during liquids removal. Provide dimensioned sump and piping drawings, if applicable. Specify the methods for determining whether the removed material is a hazardous waste and for handling it as such.

D-2 Tank Systems: 270.16; 264.191 through 264.194;

D-2a Tank Systems Description: 270.14(b)(1), 264.194(a)

The tank section (2.4) includes only the four liquid waste storage tanks. The four stabilization "bins" are also apparently intended to be permitted as tanks (see discussion in 2.4.1). The tank descriptions in both sections are indefinite. Provide descriptions of the type (i.e. aboveground and vaulted), materials of construction, and actual volume of each tank (including stabilization bins), in the tank section.

D-2a(1) Dimensions and Capacity of Each Tank: 270.16(b)

The application provides only "approximate" capacity for the liquid tanks (2.3) and "nominal" dimensions for the stabilization bins (2.4). Provide the dimensions and capacity of each tank. Provide details of the actual shape of the stabilization bins (e.g., are the ends spheroid or cylindrical?).

D-2a(2) Description of Feed Systems, Safety Cutoff, Bypass Systems and Pressure Controls: 270.16(c), 264.194(b)

The application does not include any details of the piping and other ancillary equipment which will be part of the tank systems. Provide descriptions and drawings of the feed systems, spill prevention controls, safety cutoff, bypass systems, and pressure controls (e.g., vents).

D-2a(3) Diagram of Piping, Instrumentation and Process Flow: 270.16(d)

The application does not address the information requirements of 270.16(d). Provide a diagram of piping, instrumentation and process flow for each tank system.

D-2a(4) Ignitable, Reactive, and Incompatible Wastes: 270.16(j), 264.17(b), 264.198, 264.199

The application indicates that ignitable and reactive wastes may be managed in both types of tanks. However, only general, indefinite commitments are provided (2.3.5 and 2.4.5) to ensure that ignition or unintended reactions will not occur. The application must provide details of how the tanks will be designed and operated to ensure compliance with 264.198.

When ignitable or reactive wastes are to be managed in stabilization tanks, the application must demonstrate that the wastes will be treated, rendered or mixed before or immediately after placement in the tank system so that they are no longer ignitable or reactive, and that 264.17(b) is complied with (see checklist item F-5b).

The application must demonstrate that when wastes are stored in the liquid storage tanks, the wastes will be protected against ignition or reaction by specific design or operating provisions.

If incompatible wastes are managed in tanks, demonstrate that they will not be placed in the same tank system unless 264.17(b) is complied with (see checklist item F-5b). Provide procedures assuring that hazardous waste will not be placed in a tank that previously held an incompatible waste or material unless it has been decontaminated or unless precautions have been taken per 264.17(b) to prevent reactions (see checklist item F-5).

D-6 Landfills: 270.21, 264.300 through 264.317

The landfill design provided in the application (2.5) is largely conceptual. Many of the design and construction details required in a Part B permit application are not included. Simply restating the requirements of the regulations (throughout section 2.5) does not demonstrate that the facility will be designed, constructed and operated in compliance with these requirements. The application must include final landfill design details, calculations, material and construction specifications, and operating and inspection procedures, which show how the requirements will be met.

D-6a List of Wastes: 270.21(a)

Section 2.5.1.1 of the application lists the general types of wastes to be excluded from the landfill. All other RCRA wastes are proposed to be accepted. The Part A clearly identifies the waste codes proposed to be accepted. However, the regulation requires the Part B application to include a list of the hazardous wastes to be placed in the landfill.

D-6b(2) Exemption Based on Alternative Design and Location: 270.21(b)(1), 264.301(d)

Section 2.5.2 of the application states that a "Waiver from Double Liner Requirements" is being applied for. As explained in section 4, it is apparent that the landfill is intended to have a double liner system. Revise section 2.5.2 to correctly describe the proposed liner system as an alternative double liner design.

D-6b(5) Groundwater Monitoring Exemption: 270.21(c), 264.90(b)(2)

An exemption from the Subpart F groundwater monitoring requirements is being sought, although the application does not explicitly state this fact. Section 3 explains that no shallow saturated zones exist beneath the facility, and that thick low permeability clay strata exist between the proposed landfill and the saturated zone (aquifer) at the base of the Lower Dockum Unit. The application does not address the requirements for obtaining the exemption, as required by §264.90(b)(2). If the application is revised as suggested in other comments, most of the information required may be provided. However, the application must explicitly request the exemption, and reference the locations in the application where the required information is provided. In addition, the application must demonstrate that the following requirements will be met, or explain why the exemption should include a variance from the requirements.

D-6b(5)(c) Exclusion of Liquids: 264.90(b)(2)(iii)

Statements that runoff control design will comply with the regulatory criteria (e.g., sections 2.5.1.2 and 4.2.1) are not adequate to demonstrate that the facility will be constructed and operated in compliance with those criteria. In addition, the application does not mention the requirement in §264.90(b)(2)(iii) to exclude precipitation from the unit. Only a very general description of diversion of runoff inside the unit is included (4.2.1). Water is proposed to be used to control dust inside the landfill. Since precipitation will

not be excluded, and additional water will be introduced into the landfill, a waiver from this requirement must be explicitly requested and justified in adequate detail. Provide design details and actual operating plans demonstrating how liquids, precipitation and other run-on and runoff will be excluded from the unit, or otherwise managed to justify exemption from groundwater monitoring requirements.

D-6b(5)(g) No Migration: 264.90(b)(2)(vii)

The application does not address the requirement to demonstrate "no migration". Although the computer modeling performed for the alternative liner design may provide the necessary information, the application must specifically request the groundwater monitoring exemption and justify it. Demonstrate that the unit will not allow hazardous constituents to migrate beyond the outer layer of the containment system prior to the end of the post-closure care period.

D-6c(2) Liner System Location Relative to High Water Table: 270.21(b)(1), 264.301(a)(1)(i)

Provide data showing the depth to the water table below the landfill unit and the location of the water table in relation to the base of the liner system (i.e., piezometric surface, confining strata, saturated strata, and liner foundation elevations should be shown on geological cross sections).

D-6c(3) Loads on Liner System: 270.21(b)(1), 264.301(a)(1)(i)

The application liner design discussion (2.5) does not provide calculations or results to demonstrate that the liner system can be constructed as proposed. For example, protective cover soil on the long (200 to 300 feet), steep sideslopes may become unstable during placement or after rainstorms, particularly if a 2 to 1 slope is used (Figures 2-9 and 2-10). Temperature extremes and severe downdrag forces may necessitate benching of sideslopes. Provide calculations defining the maximum loads or stresses that will be placed on the liner system considering:

- Both static and dynamic loads, including seismic loads (friction forces must be defined, requiring specification of the geomembrane type- smooth or textured- and the wet shear strength of the cover soil);
- Stresses due to installation or construction operations;
- Stresses resulting from operating equipment;
- Stresses due to the maximum quantity of waste, cover, and proposed post-closure land use;
- Stresses resulting from settlement, subsidence, or uplift; and
- Internal and external pressure gradients.

D-6c(4) Liner System Coverage: 270.21(b)(1), 264.301(a)(1)(iii)

The application discussion and drawings (Figures 2-8, 2-9 and 2-10) do not demonstrate that the liner system will be installed to cover all surrounding earth likely to be in contact with the waste or leachate. Provide construction or detailed design drawings showing the full extent of liner coverage, including all built-up or cut-down areas (final constructed grade) at the edges of the unit.

D-6c(5) Liner System Exposure Prevention: 270.21(b)(1), 264.301(a)(1)(i)

The application states (2.5.1.2) that the liner system will be covered by 2 feet of cover soil. However, the geomembranes will be exposed during construction, until the geonet(s) and cover soil are placed. Due to the very large size of the proposed landfill, the geomembranes could be exposed for several months or years before the liner system is fully completed. Provide the proposed construction scheduling sequence or phasing plans to demonstrate that the geomembranes and other liner system components will not be

exposed to potentially damaging wind or sunlight for time periods beyond the manufacturers' recommended limits.

D-6d Liner System Foundation

D-6d(1) Foundation Description: 270.21(b)(1), 264.301(a)(1)(ii)

The application (2.5) does not address foundation conditions. Although the deeper strata (40 to 100 feet) appear to be remarkably uniform and suitable for constructing strong earthworks, the shallow soils are poorly characterized. (Appendices C, D, E and F) The lithology logs (Appendix C) and the stratigraphy discussion (3.5.3.1) indicate that the upper soils are largely sand and gravel. Construction of stable steep sideslopes in these materials may require extensive overexcavation and rebuilding with material removed from greater depths. The existing topography in the landfill area (Figure 2-7) and design cross-section A-A (Figure 2-8) also suggest that the western side of the landfill perimeter may be built up (5 to 10 feet or more) to compensate for the natural surface irregularities. Describe the foundation for the liner system, including the foundation materials, and indicate bearing elevations on geological and construction drawings. Indicate any load bearing embankments placed to support the liner system.

D-6d(2) Subsurface Exploration Data: 270.21(b)(1), 264.301(a)(1)(ii)

The application does not address engineering characteristics of the liner system foundation materials. Although limited soil test results are provided in Appendices E and F, the data are not evaluated or described in the application text. Most of the samples are from boreholes which are well outside of the actual landfill perimeter. Very few soil sample analyses or test data are from the upper soils, which may be problematic for construction. The application must be revised to evaluate subsurface conditions specifically in the landfill area, and proposed sideslope construction using native soils. Additional samples and testing of shallow soils around the landfill perimeter may be necessary to adequately determine and demonstrate the suitability of these soils for constructing the liner system foundation.

D-6d(3) Laboratory Testing Data: 270.21(b)(1), 264.301(a)(1)(ii)

As noted in comments D-6d(1) and (2), the shallow soils in the immediate vicinity of the landfill are not well represented in the data provided in Appendices E and F. The sample identification information is inadequate to identify the depths of most of the test samples. The only samples identified by discrete and relatively shallow depth intervals (none above 14 feet deep) are the "Undisturbed Samples" on the second page of Appendix E. Those samples were taken from boreholes PB-10, 15 and 30. Boring PB-15 is more than 600 feet outside the landfill boundary (estimated from Figure 3-11). None of the Proctor test results identify sample depth intervals, and the sampling methods (compositing?) are not mentioned in the application text or the appendices. Therefore, the assumed suitability of the all of the native soils (including the shallow sands and gravels) for foundation and embankment construction is questionable. The application must provide data from index and moisture-density testing adequate to classify the site materials, particularly the shallow soils (0 to 20 feet deep), and demonstrate their suitability for the proposed construction. The data should be summarized and evaluated in the text of the application.

D-6d(4) Engineering Analyses: 270.21(b)(1), 264.301(a)(1)(ii)

Engineering analyses should be provided that are based on the data gathered through subsurface exploration and laboratory testing programs. With the analyses should be a discussion of the methods used, assumptions, copies of calculations, and appropriate references. Included, as appropriate, may be discussions on:

Bearing capacity [item D-6d(4)(b)];
Stability of the landfill (cut or constructed) slopes [item D-6d(4)(c)];
Potential for excess hydrostatic or gas pressure [item D-6d(4)(d)];
Seismic conditions;
Subsidence potential; and
Sinkhole potential.

D-6d(4)(a) Settlement Potential: 270.21(b)(1), 264.301(a)(1)(ii)

Provide estimates of the total and differential settlement of the liner system foundation, including immediate settlement, primary consolidation and secondary consolidation. When performing the analyses, consider the stresses imposed by the liner system and the applicable stresses computed in item d-6c(3).

D-6d(4)(b) Bearing Capacity: 270.21(b)(1), 264.301(a)(1)(ii)

Provide an analysis of the allowable bearing capacity of the liner system foundation. Compare the allowable bearing capacity to the required bearing capacity based on the loads imposed by the liner system and the applicable loads computed in item D-6c(3).

D-6d(4)(c) Stability of Landfill Slopes: 270.21(b)(1), 264.301(a)(1)(ii)

Provide, as appropriate, analyses of the stability of:

- Excavated slopes for units or portions of units constructed below grade;
- Embankment slopes for units constructed with earthen dikes or berms to support the liner system or contain the waste; and
- Landfill slopes consisting of the liner system or cover system placed on the waste.

Include in the analyses both static and dynamic cases.

D-6d(4)(d) Potential for Excess Hydrostatic or Gas Pressure: 270.21(b)(1), 264.301(a)(1)(ii)

Provide estimates of the potential for bottom heave or blow-out of the liner system or liner foundation due to unequal hydrostatic or gas pressures.

D-6e Liner System, Liners

D-6c(1) Synthetic Liners: 270.21(b)(1), 264.301(a)(1)(ii), 264.301(c)

For each synthetic liner in the system provide the following general information:

- Thickness;
- Type;
- Material; and
- Brand name and manufacturer.

Provide data for all synthetic liners under consideration. Detailed synthetic liner material specifications must also be provided as per item D-6g(1)(a).

D-6e(1)(a) Synthetic Liner Compatibility Data: 270.21(b)(1), 264.301(a)(1)(i)